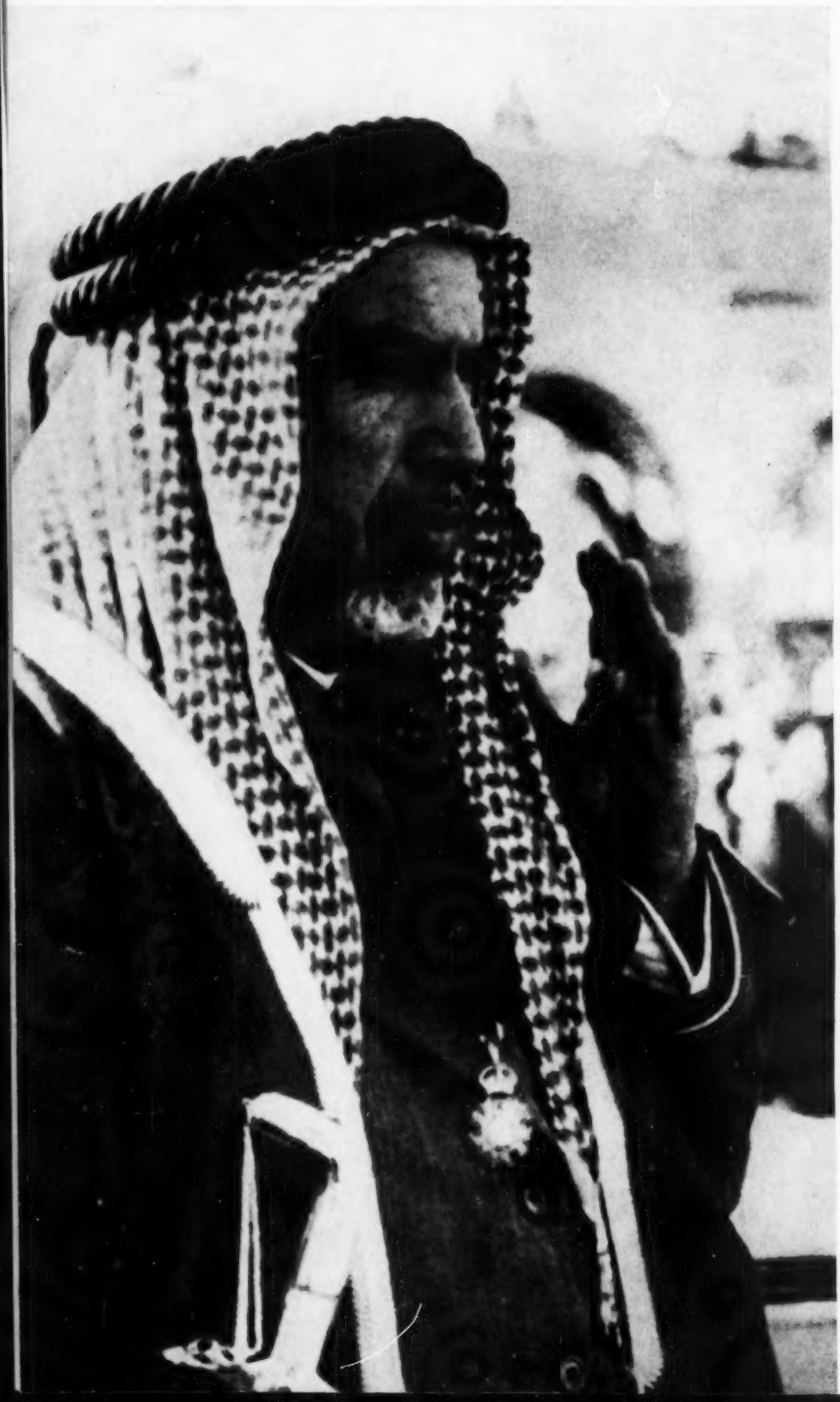
JUNE 10, 1961

Chemical Week

A McGRAW-HILL PUBLICATION PRICE FIFTY CENTS



Chemical stocks— trading tempo slows in time with profit blues . . . p. 23

Waging war on wear. Objective: to ease a $400 million/year burden . . . . . p. 37

Ethylene copolymers: lusty newcomers vie for rubber, plastics markets . . . . . p. 51

Borohydride outlook brightens as process competition promises lower prices . . . p. 63

◀ **KUWAIT'S CHIEF: CHEMICALS ARE IN HIS PLANS** . . p. 29

New Exclusive Plax Liners

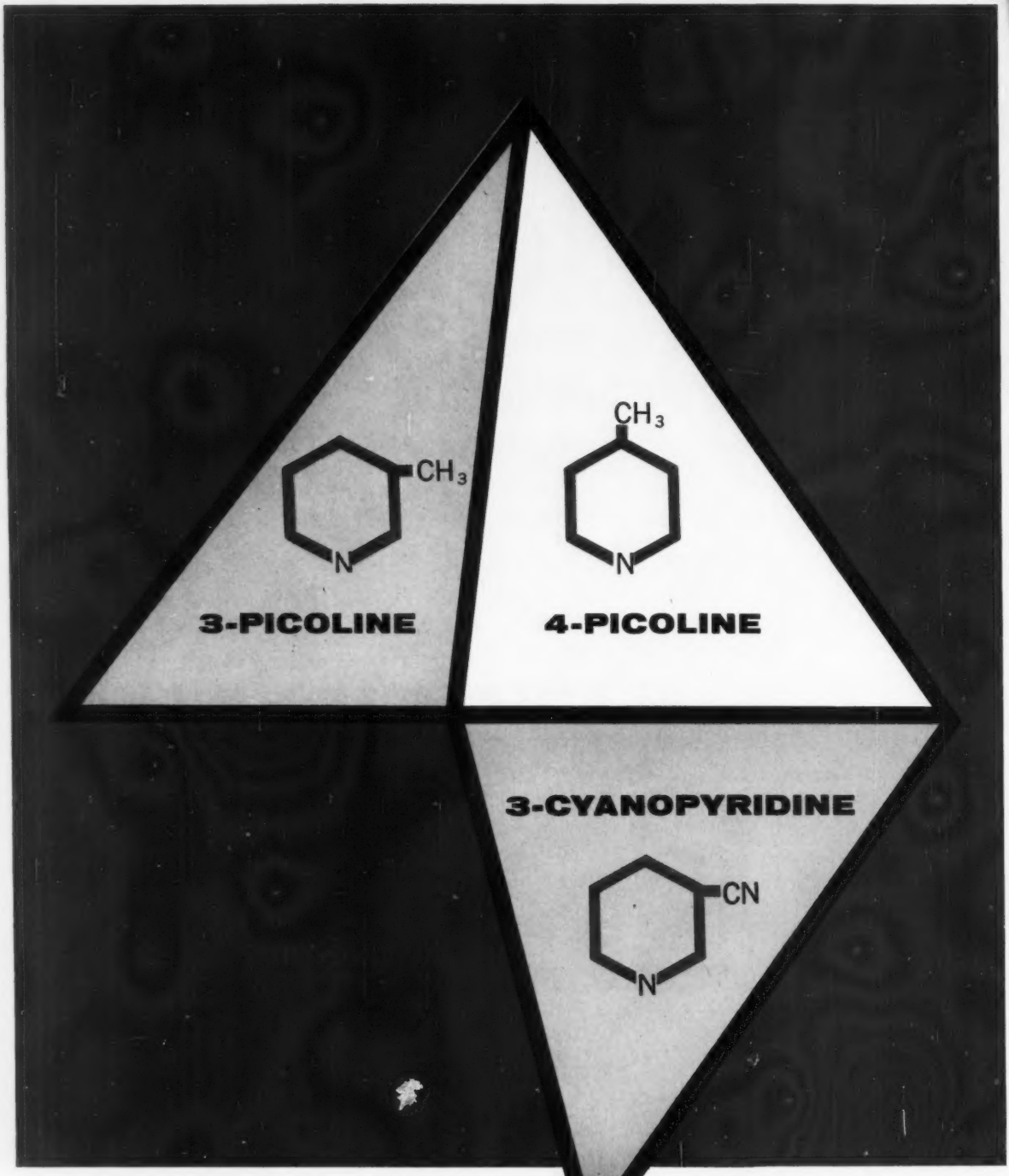
SOME PRODUCTS NEED EXTRA PROTECTION

Egg membranes form a protective inner sac around the egg's vital liquids. And now Plax builds exclusive inner liners into plastic bottle "shells" for hard-to-package liquids. These liners inhibit permeation and extend shelf-life for many pharmaceutical, cosmetic and drug products. Liquids that never could use plastic containers before can cash in on plastic's good looks, light weight and bouncy durability. This inner liner principle, coupled with the adaptability of Plax containers, could well apply to your products. Let us help.

PLAX

PLAX GIVES A PACKAGE A PLUS

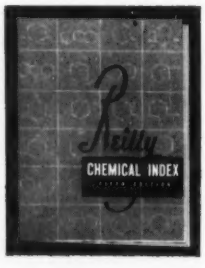
PLAX CORPORATION, HARTFORD, CONN. • In Canada: Plax Canada, Ltd., Toronto



commercially available

Shipment of high purity material made promptly

Send for your copy of the Reilly Chemical Index



REILLY TAR & CHEMICAL CORPORATION

MERCHANTS BANK BUILDING INDIANAPOLIS 4, INDIANA

Sales Offices in Principal Cities

ON THE COVER: Kuwait's Shiek Abdullah as-Salim as-Sabah has lavished his overbrimming oil revenues on social development. Now he's out to develop industry (see p. 29).

Chemical Week

Vol. 88, No. 23 JUNE 10, 1961

5 VIEWPOINT— An ammonia distributor asks why co-ops have a tax advantage.

9 LETTERS

9 MEETINGS

17 BUSINESS NEWSLETTER

23 Most chemical stocks are sagging. Here's why and what it means.

25 Germany's BASF moves its U.S. branch close to Southern textile markets.

26 Two new phosphate projects mark middle of hot-selling fertilizer season.

26 First reading on spring upturn: Celanese estimates sales up 19%, net up 56%.

27 Three multiple mergers change CPI's competitive lineup.

27 Special rail rate will speed Alberta's sulfur to Pacific.

29 INTERNATIONAL—Kuwait's petrochemical venture—Middle East bellwether?

37 PRODUCTION—CPI seeks ways to trim $400 million/year 'wear bill.'

38 Polyvinyl Chemicals gives a lesson in running training lectures.

40 Phillips Petroleum cuts chromatographic analysis time to minutes.

43 WASHINGTON NEWSLETTER

51 RESEARCH—First ethylene copolymers march onto commercial scene.

54 U.S., European labs mark analytical advances.

63 ENGINEERING—Bayer bets on low-cost process to build borohydride markets.

64 Coke chemical producers weigh pair of desulfurization processes.

75 TECHNOLOGY NEWSLETTER

79 SPECIALTIES—Novel hydrophobic clay bids for extender jobs.

80 American Snuff is off-beat, but on-time, newcomer in specialties making.

91 SALES—Monsanto unveils revamped liquids handling set-up.

92 Chemical industry's slow payers start to come across a little quicker.

94 Kennedy Administration airs views on competitive pricing, trade practices.

99 MARKET NEWSLETTER

105 ADMINISTRATION—Tax savings spur "interest pooling" mergers.

111 NLRB revises rule, allows separate production and maintenance unions.

116 BUSINESS BENCHMARKS

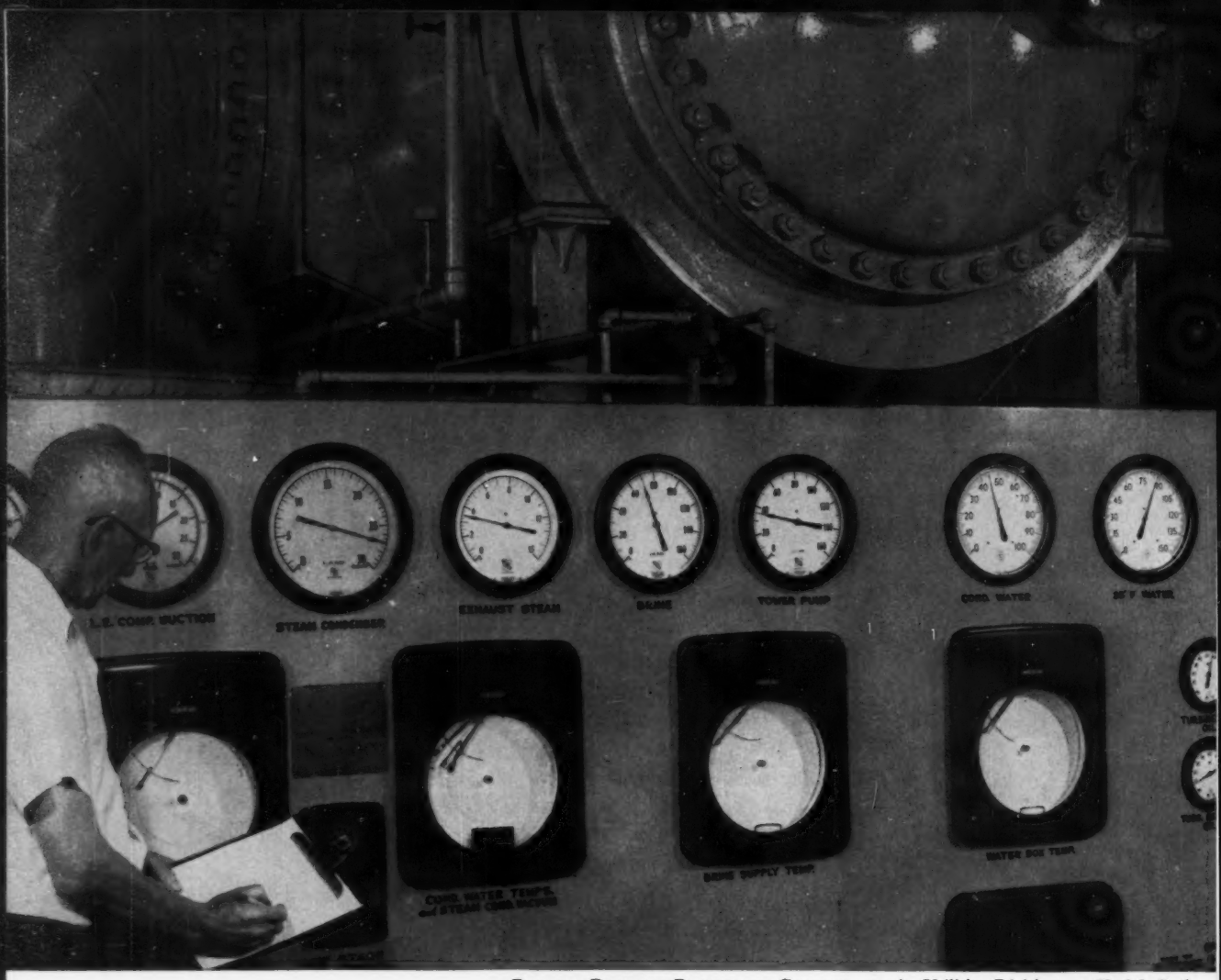
Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Telephone, LO 4-3000; Teletype, TWX N.Y. 1-1636; Cable, McGRAWHILL, N.Y. Place of publication: Philadelphia, Pa. Second class postage paid at Philadelphia. (See below for directions regarding subscriptions or change of address.) OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, president; Shelton Fisher, Wallace F. Traendly, senior vice-presidents; John R. Callaham, vice-president and editorial director; Joseph H. Allen, vice-president and director of advertising sales; A. R. Venezian, vice-president and circulation coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, president; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, executive vice-presidents; L. Keith Goodrich, vice-president and treasurer; John J. Cooke, secretary.

United States and United States possessions subscription rate for individuals in the field of the publication, $3 per year; single copies, 50¢. Foreign subscription rates per year: Canada, $4; other Western Hemisphere countries, $15; all others, $25, payable in advance. Printed in U.S.A. Title registered in U.S. Patent Office,

Chemical Week is available only by paid subscription. Subscriptions are solicited only from management men in the Chemical Process Industries in administration, production and plant operation, design and construction, research and development, and purchasing. Position, company connection and nature of company's business, products and approximate number of employees must be indicated on subscription application. Send to address shown below. Publisher reserves the right to refuse nonqualified subscriptions.

SEND SUBSCRIPTION CORRESPONDENCE AND CHANGE OF ADDRESS TO FULFILLMENT MANAGER, CHEMICAL WEEK, 330 WEST 42nd ST., NEW YORK 36, N. Y. SUBSCRIBERS SHOULD NOTIFY FULFILLMENT MANAGER PROMPTLY OF ANY CHANGE OF ADDRESS, GIVING OLD AS WELL AS NEW ADDRESS, AND INCLUDING POSTAL ZONE NUMBER, IF ANY. IF POSSIBLE, ENCLOSE AN ADDRESS LABEL FROM RECENT ISSUE OF CHEMICAL WEEK. PLEASE ALLOW ONE MONTH FOR CHANGE TO BECOME EFFECTIVE.

Postmaster: Please send Form 3579 to Chemical Week, 330 West 42nd St., New York 36, N.Y.



FOXBORO DYNALOG ELECTRONIC CONTROLLERS in Utilities Division, at Kodak Park, Rochester, N. Y. control distribution of refrigerated water throughout Kodak Park Works.

motor load – conductivity – pH – capacitance... Eastman Kodak uses Foxboro Electronic Dynalogs for dependable measurement and control

THIS FOXBORO DYNALOG CONTROLLER is used with a 1/10-inch Foxboro Magnetic Flow Meter to control flow of an additive to Kodak's paper machines at 0.1 gpm.

One basic instrument measuring and controlling these and dozens of other different variables: temperature, weight, moisture, conductivity, pAg, flow, humidity. That's what Foxboro Dynalog* Electronic Instruments do at Kodak Park Works in Rochester, N. Y.

And they're doing it without need for periodic maintenance. That's because Dynalogs have no slidewires — no balancing motors — no galvanometers. There's nothing to wear out or get out of alignment — nothing to lubricate. And simple unit construction makes changes in both type and range of measurement possible in the field — quickly and without affecting accuracy.

Ask your Foxboro Field Engineer to show you the savings possible when you standardize on Dynalog instruments. Or write for Bulletin 20-10. It has full details. The Foxboro Company, 326 Norfolk St., Foxboro, Mass.

*Reg. U.S. Pat. Off.

FOXBORO
REG. U. S. PAT. OFF.

Chemical Week

Robert S. Muller ..... **Publisher**

Howard C. E. Johnson ..... **Editor-in-Chief**

Ralph R. Schulz ..... Managing Editor
Emil J. Mikity ..... Assistant Managing Editor
J. Robert Warren .... Assistant Managing Editor
Donald P. Burke ..... Associate Editor
Anthony J. Piombino ..... Associate Editor

DEPARTMENTS

Administration ..... Joseph F. Kalina, editor
Business News ..... Homer Starr, editor
Charles Joslin; John W. Price Jr.
Engineering ..... Ryle Miller, editor
Donald M. Levin
Foreign ..... Bruce Bendow, editor
Markets ..... Richard T. Ozimek
Production ..... Herbert C. Short, editor
John P. Henry
Research ..... Philip A. Untersee, editor
Sales ..... Carl A. Hiester, editor
Victor H. Waldrop
Specialties ..... Richard J. Callahan, editor
Marion L. Meade
Reports ..... Jorma Hyypia, editor
Copy ..... William Mullinack, editor
Albert H. Kislin
Art ..... Robert T. Martinott, director
Richard Kluga; Forbes Linkhorn
Dolores Able
Buyers' Guide ..... Betsy L. Emery, editor
Patricia Middleton

REGIONAL EDITORS

Chicago ..... John M. Winton, editor
Nina Seawick
Houston ..... Thomas H. Arnold, editor
Wilma Cortines
San Francisco ..... Martin D. Robbins, editor
Maria Theresa Shaw

NATIONAL AND WORLD NEWS

Douglas Greenwald ..... Economics
John Wilhelm ..... Director, News Bureaus

Domestic

Atlanta, B. E. Barnes; **Chicago**, Stewart Ramsey; **Cleveland**, Arthur Zimmerman; **Dallas**, Marvin Reid; **Detroit**, Donald MacDonald; **Los Angeles**, Kemp Anderson, Jr.; **San Francisco**, Jenness Keene; **Seattle**, Ray Bloomberg; **Washington**, George B. Bryant, Jr. Correspondents in 75 principal cities of the United States.

Foreign

Beirut, O. M. Marashian; **Bonn**, Peter Forbath; **Caracas**, John Pearson; **London**, John Shinn; **Melbourne**, Alicja Grobtuch; **Mexico City**, Peter Weaver; **Moscow**, Ernest Conine; **Paris**, Robert Farrell; **Rio de Janeiro**, Leslie Warren; **Tokyo**, Sol Sanders. Correspondents in 78 cities.

Knox Armstrong .... **Advertising Sales Manager**
Alvin J. Babkow ..... Business Manager
Fred E. Lesner ..... Sales Promotion Manager
John M. Pierce ..... Market Service Manager
Robert L. Maier ..... Advertising Makeup
Paul W. Erb ..... Circulation Manager
Frances Regan ..... Reprints
Advertising Salesmen ..... See Adv. Index

Unfair Tax Advantage

FRANK GALLUP is an ammonia distributor in Grand Island, Neb. Testifying last month before the House Ways and Means Committee, he "wrote" our viewpoint—and as forcibly and eloquently as we could. Here are excerpts from his statement:

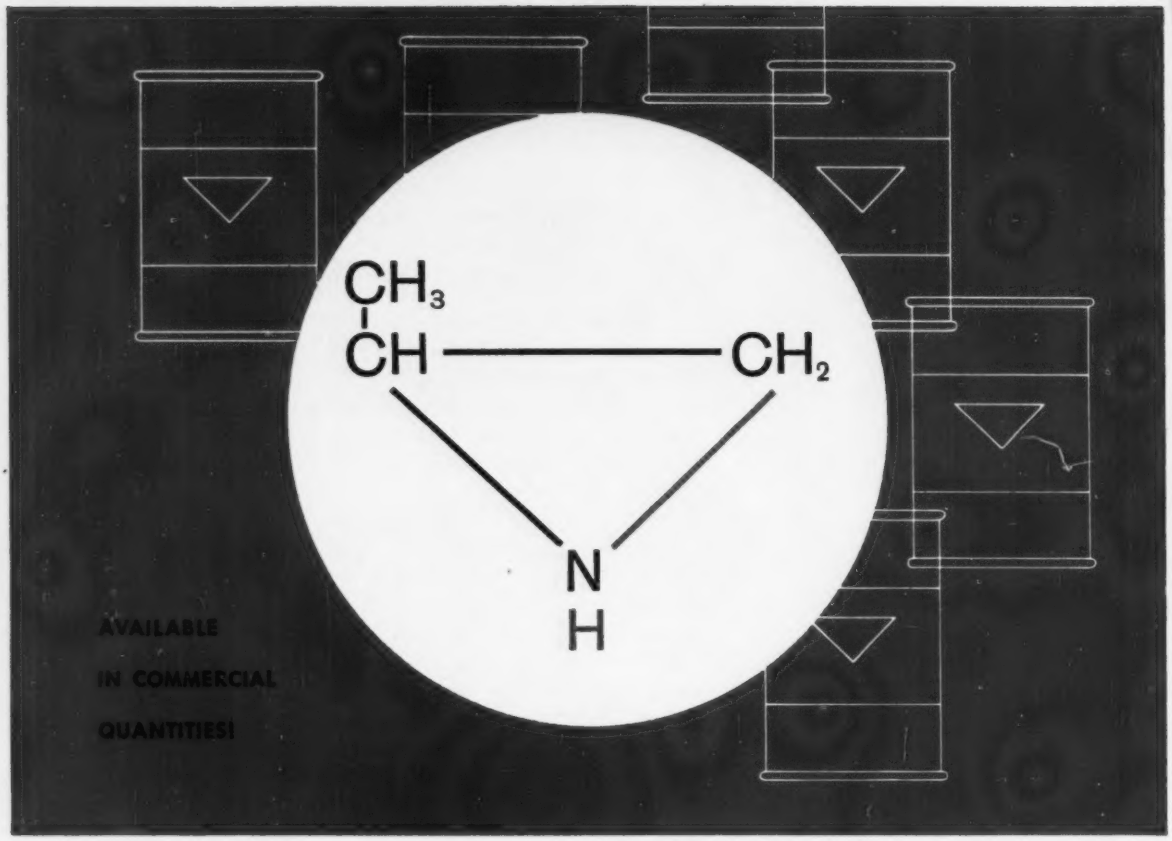
"I am here today because, despite my efforts to build a sound company, I am likely to be forced out of business in the next few years. It is not because of poor public relations, poor service, or lack of promotion. It is not that we sell an inferior product, since it is identical to that of our co-op competitors. It is just purely . . . and simply due to tax favors our competitor gets and we don't.

"It is inconceivable to me that federal tax laws can be so unfair as to let two identical businesses located on the same street in the same town performing the same service with the same customer pay different tax bills. Because of the difference, one is going downhill and the other is ready to swallow it up. Gentlemen, this is a fact; and you are looking at a fellow who is being swallowed.

"Tax-favored co-operatives now have invested substantial sums of money in the fertilizer business. They have been able to pay back the cost of this investment without paying any income taxes. Co-operatives have waited until small businessmen have pioneered . . . investments in ammonia facilities. Anyone has the right to start a business in competition with an established location; but after we have risked our capital to build the market, the co-operatives with their tax advantage are able to come in and take out their investment quickly with very little risk and still less taxes.

"When I first started this business in 1952, . . . there were in the whole state fewer than 12 ammonia tanks, . . . all of them owned by private business struggling to build a new market. In 1952, there were many co-operatives in Nebraska but they apparently did not want to take a chance on this new development. . . . By 1959, when the ammonia business was accepted, the co-operatives had 25% of the tank installations and more than 40% of the business. Projecting their rate of growth, I estimate that by 1965 they will have in excess of two-thirds of the business. Although this doesn't seem possible, ammonia tonnage from 1956 through 1959 in Nebraska increased almost 250%, but the independent-owned distributors' average tonnage actually decreased 22%. This was their reward for pioneering a new market. In a nearby town, an aggressive independent distributor's business today is only one-third of what it was in 1956. Prior to 1956, the co-operative in this area did not risk the investment in ammonia facilities, but it now does 88% of the business. . . . [Co-ops] can quickly expand and gradually force out present independent businessmen who have to pay taxes prior to any expansion program. Still less tax revenue will be forthcoming to our federal government when we are gone. . .

"Perhaps at one time co-operatives needed to be protected from taxes. But today I have to operate under present corporate rates which have increased substantially in the last twenty-five years. Protection granted co-operatives years ago under perhaps extenuating circumstances, but which no longer exist today, are about to destroy a small business like mine. . . If co-op taxes are not changed, and since we must compete against each other, the tax structure should be amended to reduce my taxes down to the co-operative level. One of the two must be done."



"VERSATILITY"...modest definition of PROPYLENE IMINE'S capabilities.

"DUAL REACTIVITY"...secondary amine+reactive ring in one compact molecule.

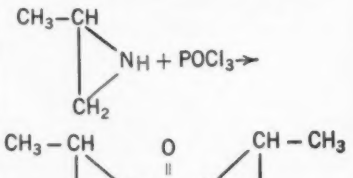
"AVAILABILITY"...commercial quantities.

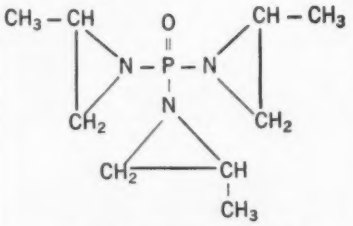
Put these factors together and you have the precise reason why Propylene Imine is a natural for your R & D program.

Those familiar with cyclic compounds of similar structure readily see that Propylene Imine is not only capable of ring opening reactions but can also function as a secondary amine. The high reactivity of Propylene Imine also means special handling . . . the respect extended to many compounds . . . but it can be processed in standard equipment. Years of research and development experience with Imines are available to assist your technical people in this matter.

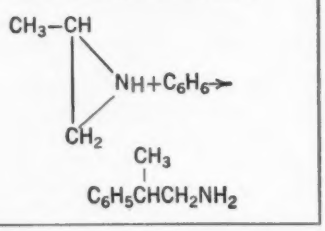
Propylene Imine is another in a series of new products from Interchemical. Other recent introductions include Cyclol and several other cyclopentadiene derivatives. For information regarding Propylene Imine, its derivatives, or any cyclopentadiene compounds, write or call:

SECONDARY AMINE REACTION:





RING OPENING REACTION:

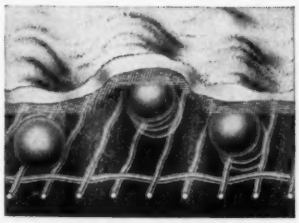


Interchemical
CORPORATION

COMMERCIAL DEVELOPMENT DEPARTMENT
67 WEST 44TH STREET, NEW YORK 36, N. Y. MU 7-4900

Follow the bouncing ball to fast, accurate sifting

Standard Day Ro-Ball Sifter
Day Ro-Ball sifters with super-active ball cleaners assure clear screens and free passage of through product.



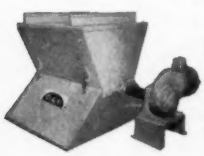
Super-active bouncing balls within the Day Ro-Ball sifter constantly keep the screen clear and hasten the flow of particles through the mesh openings. The gyrating sifter action brings material into contact with every inch of screen. Sifting time is greatly reduced and accurate product sizing is assured.

Day Ro-Ball sifters are ruggedly constructed to provide many years of trouble-free service. A stabilizer eliminates sifter rocking. Self-aligning, slide-type, tail-end bearings are extra large for long life. A horizontal drag link maintains bearing alignment and assures smooth, quiet sifter operation.

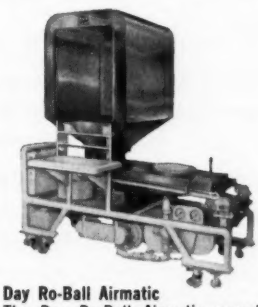
The Ro-Ball sifters may be combined with allied Day processing equipment to reduce material handling and save valuable floor space. These sifters are built in a complete range of sizes for single or multiple screening of a wide variety of materials with center or end discharge points.

DAY BUILDS A COMPLETE LINE OF SIFTERS

Day Sanitary Ro-Ball
Three sizes of Day Ro-Ball sifters are available in sanitary models which conform to Dairy Institute Code for production of grade "A" products. Top cover, bottom pan and screens are made of stainless steel. The sanitary Ro-Ball is easiest of all sifters to clean and keep clean.



Day Brush Sifter
Brushing action breaks up and coarse screens lumpy material. Available in stainless steel and wooden models with brush sizes from 14" to 36" in length.



Day Ro-Ball Airmatic
The Day Ro-Ball Airmatic operates as three units in one; it is a dump bin, a sifter, and a pneumatic conveyor. A self-contained blower conveys up to 100 lbs. of material a minute to other equipment or storage bins. Casters are available for easy portability.

Day Power Screen
The Day Power Screen handles difficult materials such as sugar, powdered milk, malt and other products that tend to gum up in reciprocating sifters. All the latest concepts in sanitary design are incorporated in the power screen sifter.

Day Moto-Sifter
The Day Moto-Sifter efficiently sifts and aerates materials such as flour at the rate of 150 lbs. per minute.

Write for bulletin No. 957 or take advantage of Day Laboratory to test your product.

DAY

The J. H. DAY Co.
Division of The Cleveland Automatic Machine Co.
4928 BEECH ST., CINCINNATI 12, OHIO

MANUFACTURERS OF QUALITY MIXING, BLENDING, SIFTING, MILLING EQUIPMENT SINCE 1887

Shell has three benzene-producing refineries, located near waterways. Barges like these will carry the bulk of 1961's record output.

BULLETIN:

Shell has increased benzene production to meet your rising needs— capacity now exceeds 80 million gallons

Shell has increased its benzene production nearly 500 percent in less than 18 months. Shell's benzene-producing capacity in the U. S. is now the largest in the world.

Shell's stepped-up output comes to you via a nationwide supply network served by 3 refineries.

Read how Shell's increased benzene production can help you meet your rising benzene requirements now.

WITH DEMAND for benzene at an all-time high, and with new uses coming along each year, Shell is producing more benzene now than ever before.

Bigger supplies now

Shell has stepped up production of benzene again. Shell's capacity has already topped 80 million gallons of high purity benzene. *And Shell has nationwide facilities for producing and distributing benzene.*

Widest distribution

Shell Benzene is produced at three refineries. At Wood River, Illinois; Houston, Texas; and Wilmington, California.

NOTE: All three refineries are located near waterways. You can take delivery of Shell Benzene in barges, in tank cars and transport trucks. Deliveries can come direct from the refinery.

Formulators use Shell Benzene when precise control is vital. The quality of Shell Benzene is consistently high.

And it is free of Thiophene.

For full facts on Shell Benzene, contact your Shell Industrial Products Representative. Or write: Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

SHELL

A BULLETIN FROM SHELL
—where 1,997 scientists are working to provide better products for industry

LETTERS

Polyester Resin

To THE EDITOR: Your recent article on filament-wound reinforced plastic (*April 8, p. 51*) struck a responsive chord here, particularly in view of the reference to ". . . a bisphenol-A polyester resin that is said to have greater corrosion resistance than general-purpose polyesters."

. . . This . . . is our patented Atlac 382 polyester. It is finding increasing use in the fabrication of corrosion-resistant tanks, tank linings, fume ducts and hoods. It is also being used in corrosion-resistant mortars, cements, adhesives and flooring compounds.

GEORGE O. RUDKIN, JR.
Associate Director
Product Development Dept.
Chemicals Division
Atlas Powder Co.
Wilmington, Del.

Low-Temperature Sensing

To THE EDITOR: [Re] . . . your article "Better Ways to Tell Temperature" (*April 1, p. 46*).

Since we can hardly believe that your report is intentionally biased, we must consider the omission of thermistors as [an] . . . oversight. While other low-temperature sensing elements mentioned in your report exist only in a relatively small number of experimental units, low-temperature thermistors are used in the field in thousands of operational units. . . .

H. B. SACHSE
Research Director
Keystone Carbon Co.
Saint Marys, Pa.

MEETINGS

Society of the Plastics Industry, Inc., national plastics conference, New York Coliseum, New York, June 5-9.

National Congress on Environmental Health, University of Michigan School of Public Health, Ann Arbor, June 6-8.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

Manufacturing Chemists' Assn., annual meeting, Greenbrier, White Sulphur Springs, W. Va., June 8-10.

13th International Chemical Engineering Exposition and Congress, Frankfort, Germany, June 9-17.

National Plant Food Institute, annual convention, The Greenbrier, White Sulphur Springs, W.Va., June 11-14.

Air Pollution Control Assn., 54th annual meeting, Hotel Commodore, N.Y., June 11-15.

Gordon Research Conferences, June 12-16; Colby Junior College, New London, N.H.—petroleum; New Hampton School, New Hampton, N.H.—chemistry of coal; Kimball Union Academy, Meriden, N.H.—lipide metabolism.

Instrument Society of America, Air Pollution Instrumentation Symposium (with June 12-16 annual meeting of the Air Pollution Control Assn.); sponsors: ISA and APCA, Hotel Commodore, New York City, June 12.

Quality-control conferences, industrial statistics and quality control for the chemical and processing industries, an introduction to statistical quality control, Rochester Institute of Technology, Rochester, N.Y. June 12-21.

Institute of Aerospace Scientists and American Rocket Society national joint meeting, Ambassador Hotel, Los Angeles, June 13-15.

Instrument Society of America, third biennial international symposium on gas chromatography, Kellogg Center, Michigan State University, East Lansing, June 13-16.

American Society of Pharmacognosy, annual meeting, University of Houston, Houston, Tex. June 19-21.

Fifth biennial carbon conference; cosponsors: Pennsylvania State University and American Carbon Committee; Pennsylvania State University, University Park, Pa., June 19-23.

American Assn. of Cost Engineers, annual meeting, Somerset Hotel, Boston, June 21-23.

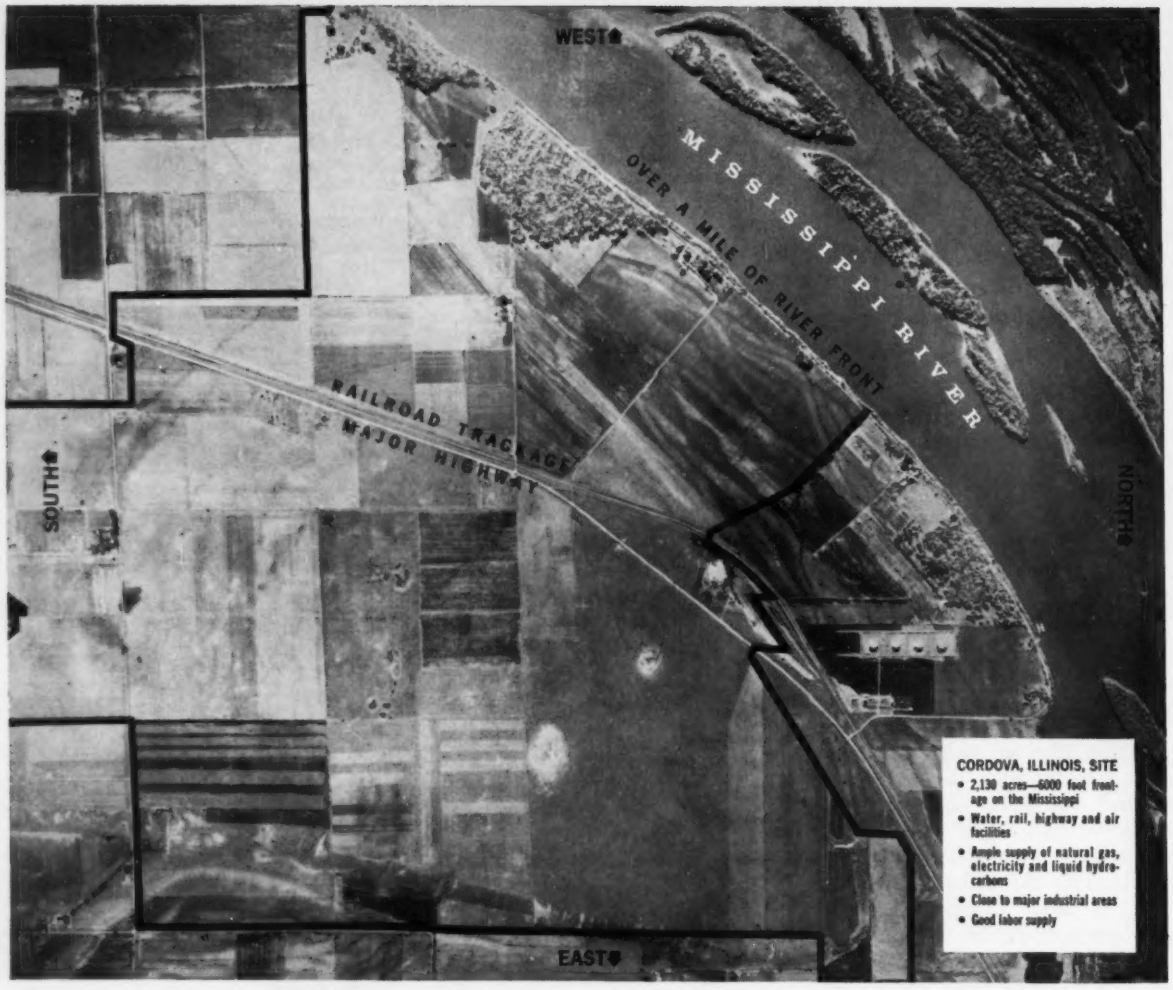
Parenteral Drug Assn. Inc., Warwick Hotel, Philadelphia, June 23.

American Society for Testing Materials, 64th annual meeting, Chalfonte-Haddon Hall, Atlantic City, N.J., June 25-30.

Instrument Society of America, automatic-control conference, Penn Sheraton Hotel, Pittsburgh, Pa., June 28.

Instrument Society of America, second joint automatic control conference, University of Colorado, Boulder, Colo. June 28-30.

18th International Congress of Pure and Applied Chemistry, Montreal, Can., Aug. 6-12.



A NEW SITE THAT *HAS EVERYTHING* A CHEMICAL COMPANY NEEDS!

On the Mississippi River in Rock Island County, Illinois, fifteen miles northeast of the Quad Cities, is a brand new industrial tract called the Cordova site. This site is tailor-made for chemical process industries. Raw materials in the form of liquid petroleum gases and other industrial location advantages are now available—close to a major consuming market on a principal waterway.

Located near the town of Cordova, it consists of 2,130 acres of level flood-free land with 6000 feet of river frontage, and extends up to one and a half miles back from the river. The topography is level to gently rolling.

AN ABUNDANCE OF LPG, WATER AND POWER

LP and natural gas pipelines serve the area. In conjunction with a liquid extraction plant now under construction in Kansas, these lines will permit supplying chemical feed stocks at the Cordova site. An unlimited supply of dependable power is assured by two large generating stations in the Quad Cities and interconnections with others throughout the Middle West. Water, another basic CPI raw material, may be withdrawn from the Mississippi in unlimited quantities. Deep wells in the area supply pure water. Treated sewage may be emptied into the river.

LOCATED IN ONE OF THREE GREATEST GROWTH MARKET AREAS IN NATION

Within a 300 mile radius of Cordova are such major industrial centers as: Chicago, Gary, Fort Wayne, Minneapolis-St. Paul, St. Louis, Des Moines, Quad Cities, Rockford, Omaha. And in the area immediately surrounding, there is an ample supply of high-type labor.

EXCELLENT WATER, RAIL, HIGHWAY, AIR TRANSPORTATION

The navigable channel of the Mississippi River, open for traffic 9½ months of the year, extends along the entire river frontage close to shore. Two miles of railroad track cross the site, connecting with mainline junctions at Savanna, Illinois, and the Quad Cities. A major highway parallels the rail right-of-way . . . and the Quad-City Metropolitan Airport is only minutes away.

The availability of liquid petroleum gases, location on a principal waterway, nearness to a major consuming market — three solid reasons why the Cordova site is ideally suited to chemical and petrochemical companies.

For more information, contact —

IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

Charles H. Whitmore, President • 206 E. 2nd Street, Davenport, Iowa

NORTHERN GAS PRODUCTS COMPANY

Phillip A. Gass, President • 2223 Dodge Street, Omaha, Nebraska

How to have nerves of Fe

AMSCO is first in solvent sales because AMSCO is first in research. If you're nervous about solvent problems call AMSCO. You'll get what you want, where you want it, when you want it.

AMSCO

AMERICAN MINERAL SPIRITS CO.

NEW YORK	CHICAGO	LOS ANGELES
General Eastern Office	200 South Michigan Ave.	8600 South Garfield
Murray Hill, N. J.	Chicago 4, Illinois	South Gate, California

SERVICE COAST-TO-COAST

FILTER FABRIC QUIZ

How would you solve these filter fabric problems?

PROBLEM:

You're a soap manufacturer. You wish to filter foreign matter from oil and glycerin. What filter fabric would you use?

SOLUTION:

Closely woven cotton duck has withstood six months of this arduous service. For even longer life, nylon fabrics are recommended.

PROBLEM:

You're a dyestuffs manufacturer. You wish to separate a dye intermediate from a sulphuric and hydrochloric acid solution at 45°C. What filter fabric would you use?

SOLUTION:

A spun dynel fabric with high chemical resistance is both dependable and durable for this highly corrosive process.

PROBLEM:

You're a ceramics manufacturer. You wish to filter clay slurries. And the filter fabric must have good release characteristics and resist mildew and bacteria growth. What filter fabric would you use?

SOLUTION:

A tough fabric of filament nylon is sleek enough that the filter cake drops away at the touch of a scraper—and so durable that fabric life is multiplied many times.

PROBLEM:

You're a pigment processor. You wish to filter titanium dioxide from strong acid solutions with vacuum-type filters. What filter fabric would you use?

SOLUTION:

A fabric of filament Dacron*, highly resistant to mineral acids, provides smooth cake discharge and long service for maximum operating economy.

Each of these solutions is but one of many ways to solve these problems. For, as you know, countless factors help determine a filter fabric's performance—fiber, yarn, weave, count and finish, to name just a few. Selecting the most effective and economical filter fabric for a particular job is a very complex matter. And you need the assistance of a specialist—like the specialists who distribute Wellington Sears fabrics. These distributors are experts in the field of industrial fabrics—and always ready to lend a hand in helping solve your problems. For their names, and a free copy of our illustrated booklet, "Filter Fabric Facts," write Dept. M-6 today.

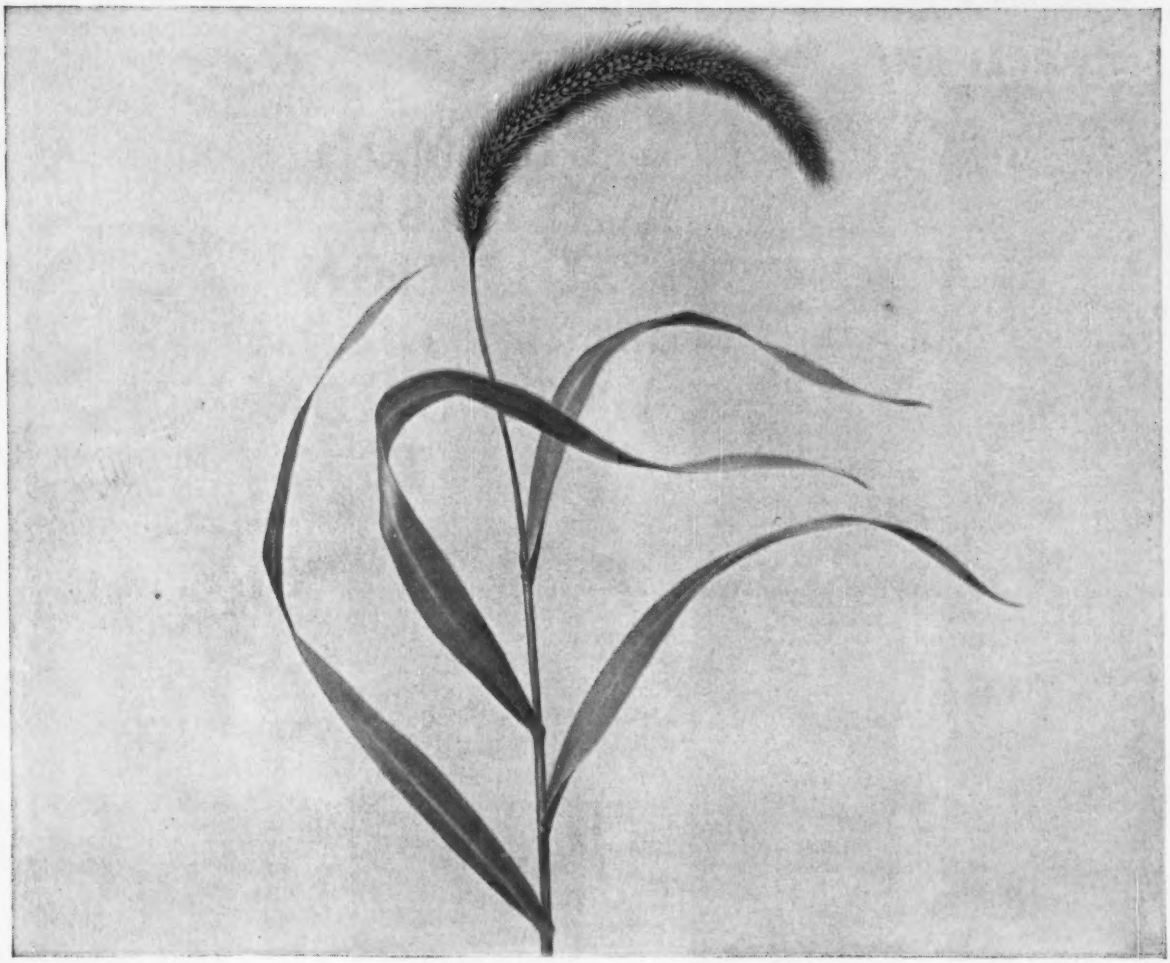
*DuPont trademark for its polyester fiber

WELLINGTON SEARS WEST POINT TEXTILES

FIRST IN FABRICS FOR INDUSTRY

Wellington Sears Company, 111 West 40th St., New York 18 · Akron · Atlanta · Boston · Chicago · Dallas · Detroit · Los Angeles · Philadelphia · San Francisco

NAUGATUCK CHEMISTRY MAKES THINGS HAPPEN



Giant Killer

ALANAP You're looking at a giant foxtail weed that can reduce soybean yields up to 40%. Eradicating this relentless enemy is of vital concern since soybeans are a highly important crop—doubling in 10 years to over 600 million bushels grown annually on some 23 million acres. ALANAP®, Naugatuck Chemical's powerful pre-emergence weed control, kills this giant killer—stamps out giant foxtail and other weeds before they get started, thereby increasing yields with just one application.

Agriculture is but one of many industries where Naugatuck chemistry does things better. Through a creative and imaginative research program, the Naugatuck Chemical Division of United States Rubber Company has been an outstanding leader in the agricultural chemical, rubber, plastic and latex industries for more than 50 years.

For more information on ALANAP and other Naugatuck products, write Naugatuck Chemical, Department C6, Naugatuck, Connecticut.

NAUGATUCK CHEMICAL DIVISION **United States Rubber**

COMMON SENSE SOLUTION TO EXTRACTION COSTS

...CELANESE METHANOL

Celanese Methanol offers lower raw material costs in the face of *rising* prices for other alcohols.

Common sense suggests that you examine your applications with an eye to cost savings through the use of methanol in place of the alcohol you're now using.

Celanese Methanol may offer substantial advantages over isopropanol in automotive chemicals, laminates, pharmaceutical extractions, metal cleaning and petroleum processing . . . or in place of ethanol in petroleum processing, as a dye solvent, and in film manufacture. In many applications, methanol is the cost-saving and efficient solution.

Why get caught by rising prices, when low-cost methanol is promptly available from Celanese. Write for Product Bulletin S-03-6, or contact your Celanese representative or distributor for full details. Now.

Celanese Chemical Company, Dept. 552-F, 180 Madison Ave., New York 16, N.Y.

Celanese®

Celanese CHEMICALS

Celanese Chemical Company is a Division of Celanese Corporation of America.
Canadian Affiliate: Canadian Chemical Company Limited, Montreal, Toronto, Vancouver.
Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Avenue, New York 16.

News from
National Carbon Company
Division of Union Carbide Corporation · 270 Park Avenue, New York 17, New York
In Canada: Union Carbide Canada Limited, Toronto 12

National Carbon representatives expand your engineering force

N. R. SWENSEN
Sales Engineer

Mr. Swensen is National Carbon's field sales engineer for chemical products in the State of Ohio, with headquarters in Cleveland.

As a member of National Carbon's application engineering group, he was active in the design and development of chemical processing equipment, particularly entrainment separators and hydrochloric acid absorption systems.

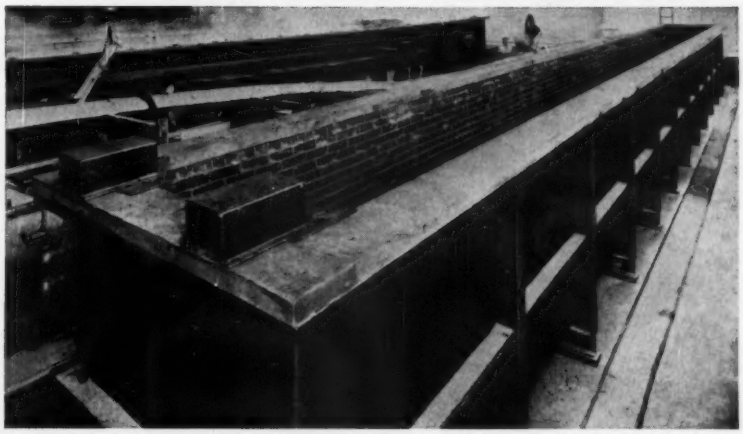
Mr. Swensen is a graduate of Michigan State University. He joined National Carbon Company in 1957.

Carbon Saddle Packing withstands abrupt temperature changes without spalling

Developed jointly by National Carbon Company and The United States Stoneware Company, carbon "INTALOX" saddle packing has a broad range of chemical applications. These saddles are recommended for hot alkalis, mixtures of hydrofluoric and sulphuric acids, hydrofluoric acid, and phosphoric acid—uses where chemical-resistant ceramics would be unsuitable. The unique carbon shape assures maximum contact surface between liquid and gas or between liquid and liquid. For data, write The United States Stoneware Company, 60 East 42nd Street, New York 17, N. Y.

"INTALOX" is a registered trade-mark of The United States Stoneware Company

"NATIONAL" CARBON BRICK LININGS PROVIDE LONG SERVICE LIFE IN TOUGH CORROSION APPLICATIONS



Carbon brick combines unsurpassed resistance to corrosion, abrasion, and thermal shock, with dimensional stability. It is the ideal lining material for tanks, reactors, drain troughs and sumps handling difficult corrosive media.

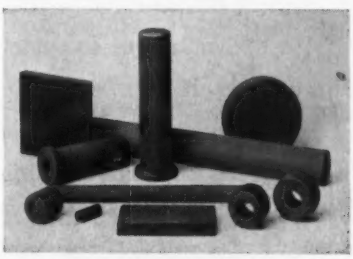
Carbon brick are giving remarkably long service life in sulfate pulp digestors, nitric-hydrofluoric acid pickling tanks, wet process phosphoric acid digestor tanks, organic-sulphuric acid alkylation stripping towers and phosphoric acid concentrators.

The 9" x 4½" x 2½" series is stocked in 11 different shapes. In addition, circle brick 4½" wide x 2½" thick are made to order. For details, request **Catalog Section S-6215.**

"NATIONAL" POROUS CARBON Solves Corrosion Problem in Caustic and HF Filtering

Because of its chemical resistance to sodium hydroxide, hydrofluoric acid, and phosphoric acid, porous carbon is widely used for tubes and plates in filters handling these corrosives.

This versatile material is available in a wide variety of rod, plate, and block sizes. It can easily be machined and fabricated into tube, plate, and tear-drop diffusing and filtering elements.



In recent years, porous carbon has also been used as insulation for high-temperature furnaces and reactors, where resistance to corrosion and dimensional stability at high temperatures are essential.

Hydrotropes

These Stepanates are excellent solubilizing and coupling agents for otherwise incompatible materials. They permit you to take full advantage of combinations of organic surfactants and inorganic phosphates, silicates, etc. Frequently they are the most effective means of overcoming turbidity or stratification in aqueous products containing a sparingly-soluble oil or solid. For light-duty liquids Stepanates are cloud point depressors. Stepanate hydrotropes are practically water white liquids.

Stepanate K
potassium toluenesulfonate

Stepanate T
sodium toluenesulfonate

Stepanate X
sodium xylenesulfonate

Stepanate XK
potassium xylenesulfonate

Stepanate AM
ammonium xylenesulfonate

Write for Technical Bulletin
STEPAN CHEMICAL COMPANY
Edens & Winnetka, Northfield, Illinois
Telephone HIllcrest 6-7500

STEPAN

Business Newsletter

CHEMICAL WEEK
June 10, 1961

Hot beryllium news. The U.S. will soon be in a position to shuck its dependence on foreign raw material required in the production of the "space age" metal. The Beryllium Corp. has teamed up with United Technical Industries to produce beryllium oxide via a proprietary UTI chemical process.

Beryllium Corp. will use the oxide to turn out, for the first time, commercial quantities of the metal from a domestic supply of beryllium ores.

The joint venture (to be managed by a four-man Executive Committee—two from each company), will operate a plant, now nearing completion, at Delta, Utah. The plant will draw upon the large reserves of disseminated clays on UTI's properties in the Spors-Topaz Mountain area of Southwest Utah.

No official figures are available, but capitalization of the project reportedly is in excess of $1 million. (Beryllium oxide currently sells at $8-9/lb.).

•

A new propylene oxide plant will go up on Wyandotte Chemicals' recently acquired 23 acres of waterfront property near Wyandotte, Mich. There has been considerable trade speculation as to what would be built on the site.

Wyandotte's directors okayed a $3.5-million expenditure for the new oxide unit. Output, indicates President Robert Semple, will be used to "meet the growing demands of the detergent and urethane markets."

Meanwhile, the company has just bought 24 acres of industrial property at Ontario, Calif., as part of its long-range development program, but hasn't decided yet what to do with it.

•

A little more on the sorbitol plant that will be the first chemical production project for importer and distributor, Baird Chemical Industries, (*CW Business Newsletter, Apr. 1*).

The company isn't ready to reveal details yet, but the plant will be built somewhere in Illinois. Capacity estimate: 20 million lbs./year.

•

Dow is having court troubles over Dow-Gard, its year-round radiator coolant. A suit was filed in Federal District Court in Houston late last week, charging the company with "false advertising and unfair competition."

The suit was brought by a Houston inventor and specialty chemicals producer, Marvin G. Teutsch, who is asking "at least $300,000 damages."

Teutsch claims that in '57 and '58, he invented, produced, and began selling a product called Perma-Clean Motor Coolant. He went to

Business Newsletter

(Continued)

Dow to buy some of the chemicals for his product, he alleges, and within a couple of years, Dow came out with Dow-Gard advertised as the "world's first" year-round coolant.

Date for trial has not been set, but presumably summonses are now being issued by the court. The case could come up in a few months.

•

Conversion of sea water to fresh water is moving ahead rapidly in the U.S. (*see also Technology Newsletter, p. 76*) Western Electric, has begun construction of a 1-million gal./day plant that should be ready for operation in November.

The plant is being built at Point Loma, Calif., near San Diego, under a contract awarded by the U.S. Dept. of Interior's Office of Saline Water. Joint sponsor is the state of California Dept. of Water Resources.

The project, when completed, will be the largest multistage flash-evaporator plant in the U.S.

•

Plans for a new hydrogen peroxide plant were revealed this week by Food Machinery and Chemical director and former president, Ernest Hart. The new "multimillion dollar" unit will go up in South Charleston, W. Va. Full production is slated for late '62.

Hart spoke at ceremonies marking the transfer of the former So. Charleston Naval Ordnance plant to FMC. He also said that Bechtel Corp. has been engaged to "undertake a complete plant study" of the 197-acre Ordnance site on the Kanawha River. All five of FMC's chemical divisions, as well as the corporation's Ordnance and Machinery Divisions are investigating the possibility of building new facilities at the site.

•

Du Pont is bidding for more time in which to dispose of its GM stock. The company, moving quickly after the Supreme Court's adverse decision (*CW, June 3, p. 21*), wants 20 years, rather than 10, to divest itself of some $3 billion worth of General Motors stock. The additional decade, says Du Pont, would greatly ease the "harsh tax consequences" for Du Pont stockholders.

It's expected in Washington, that the Supreme Court will act promptly on the request—probably before adjournment late this month or early in July.

The case then will go back to Judge Walter La Buy in Chicago. La Buy retired last January, but will be recalled for this case.

•

More trouble for U.S. companies with Caribbean investment? The assassination of Dominican Republic dictator Rafael Trujillo could spark a power struggle. Chaos would give Cuba's Castro another opening to spread his influence, play hob with U.S. interests. It could spell trouble in Haiti, and in countries like Venezuela, which is already under Fidelista pressures.

All this for me?

Yes . . . this is one of the laboratories where we test new IFF fragrances "in the product" to be sure they are technically as well as aesthetically correct.

WONDERFUL WORLD OF FRAGRANCE

Service facilities, such as this Cosmetic Laboratory at IFF, New York, fully test newly-created perfumes and aromatic materials for shelf-life and compatability in all types of consumer products where fragrance is a factor.

In addition to the imaginative artistry of the perfumer, the creation of a successful new fragrance requires a thorough technical understanding of its use in the product for which it is produced. It is only with such thoroughness that truly outstanding perfumes can be developed to assure your new product effective and lasting sales appeal.

iff

VAN AMERINGEN-HAEBLER • POLAK & SCHWARZ

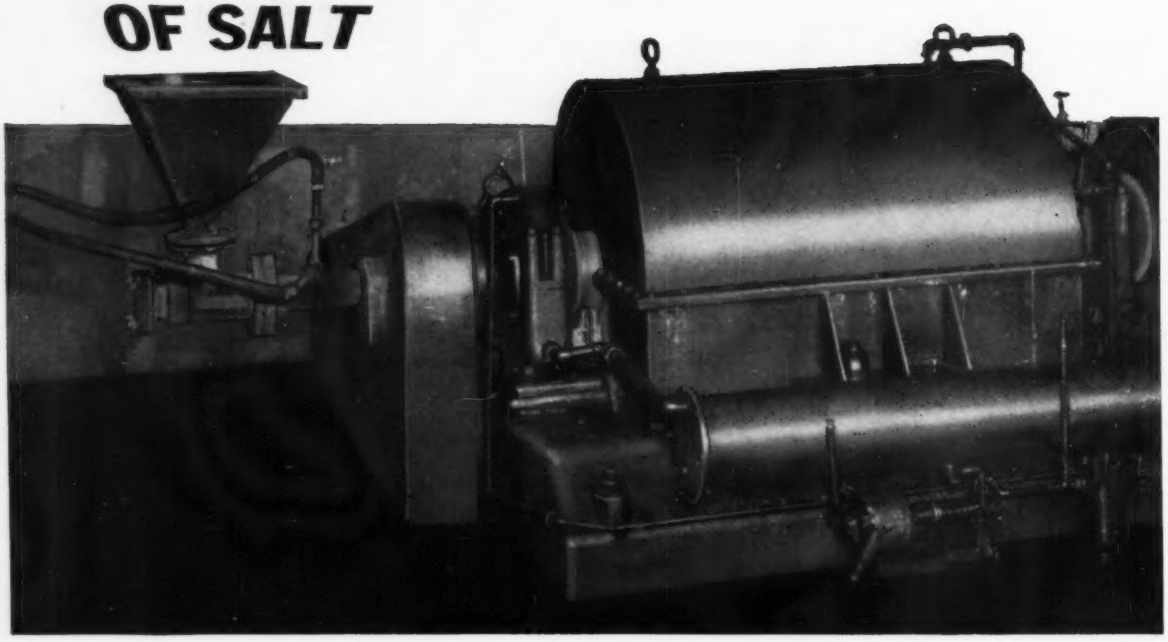
INTERNATIONAL FLAVORS & FRAGRANCES INC.

521 West 57th St. • New York 19, N.Y.

Creators and Manufacturers of Flavors, Fragrances and Aromatic Chemicals

ARGENTINA AUSTRIA BELGIUM BRAZIL CANADA ENGLAND FRANCE GERMANY HOLLAND ITALY NORWAY SOUTH AFRICA SWEDEN SWITZERLAND U.S.A.

MILLIONS OF TONS OF SALT



Are now separated from Caustic Solution in **Bird Continuous Centrifugals** like this

What this means to you

Salt from caustic is a comparatively easy filtering job. They used to think any old filter would do. Now, the bulk of this huge tonnage is put through Bird Centrifugals.

For example, the last three big electrolytic caustic plants built are all equipped one hundred per cent with Bird Continuous Centrifugals to handle both the strong and weak caustic solutions. Birds were installed only after careful and comprehensive comparison with all kinds of solid-liquid separating methods and equipment.

Whether *your* slurry is free filtering or slow, thick or thin, hot or cold, find out what the Bird Continuous Centrifugal can do in terms of solids dryness, filtrate clarity, output per hour and cost per ton. The Bird Research and Development Center can provide the answers via pilot-scale tests, promptly, accurately and in confidence.

This Bird delivers 3 tons of salt per hour — runs continuously 24 hours a day, 7 days a week. It has been on the job for twenty-two years.

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASSACHUSETTS

BUILDERS OF THE COMPLETE LINE OF SOLID-LIQUID SEPARATING EQUIPMENT

Operators of the **Bird Research and Development Center** for pilot-scale testing to determine the correct equipment for the job. Yours to use.

Application Engineering Offices:

EVANSTON, ILL. • ATLANTA, GA. • HUNTINGTON, W. VA. • LAPORTE, TEXAS • WALNUT CREEK, CALIF.

SYMBOL
OF
PRODUCT QUALITY
AND
SERVICE
IN
CHEMICALS

PRODUCERS OF

Alkyl Lead Compounds: Tetraethyl Lead • Tetramethyl Lead • TEL-TML mixes (unreacted) • TEL-TML mixes (reacted)

Ethylene Oxide and Ethylene Glycols: Anti-freeze Grade Glycol • Anti-freeze (formulated) • Diethylene Glycol
Industrial Grade Glycol • Triethylene Glycol

Sulfuric Acid **Oleums** (all strengths)

Bromine Compounds: Ethylene Dibromide • Bromine (elemental)

HOUSTON CHEMICAL CORPORATION, 200 MADISON AVENUE, NEW YORK 16, N. Y.

8 CASES IN POINT...

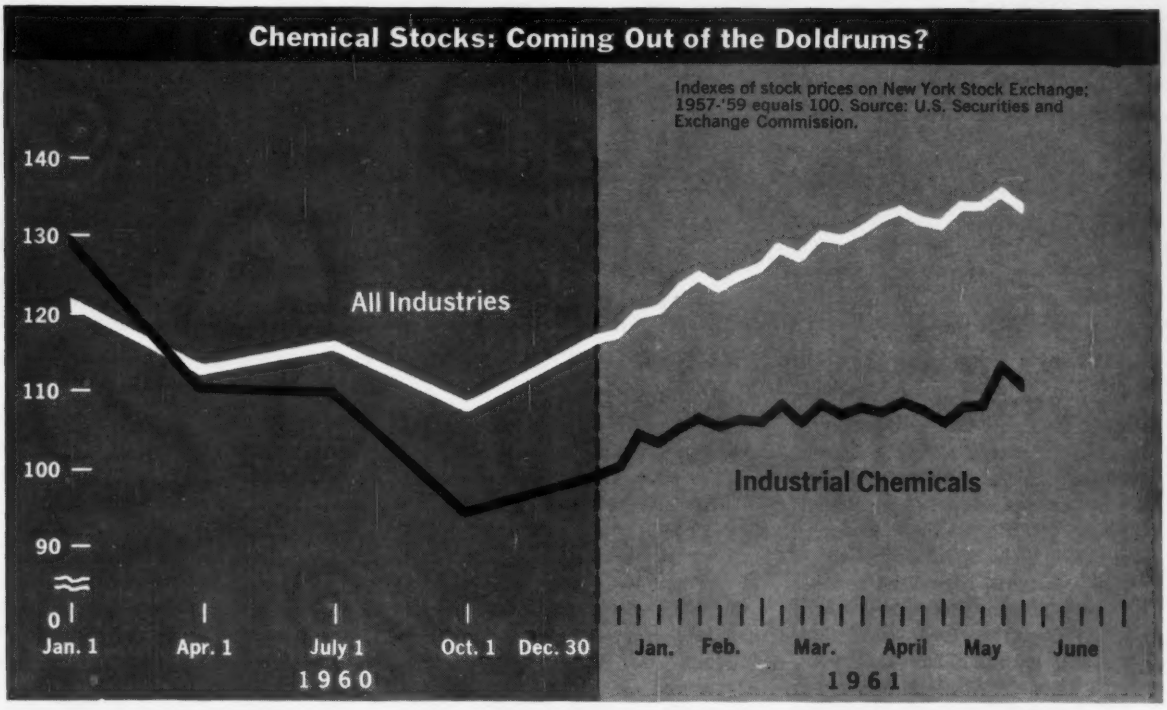
Admex plasticizers help major vinyl floor covering producers win satisfied customers

More and more producers of vinyl floor coverings are finding that Admex plasticizers help their products live up to customers' expectations . . . at the lowest possible cost. A decade of on-the-floor performance —in homes, offices, institutions and stores—proves that Admex plasticizers give vinyl flooring compounds superior heat and light stability . . . greater dimensional stability . . . excellent solvent, soapy-water, and grease resistance . . . faster production with fewer rejects.

Admex quality is high, its uniformity unequaled. Besides a strong basic raw materials position, ADM has pursued an aggressive plasticizer research program for over 10 years. Today ADM has 12 Admex products, conveniently warehoused throughout the country. That's why Admex is specified by all the leading floor covering manufacturers.

If you haven't investigated Admex, we hope you will. Write, wire or call us.

Archer-Daniels-Midland
CHEMICAL GROUP
707 INVESTORS BUILDING
MINNEAPOLIS 2, MINNESOTA



New Start for Chemical Stocks

Coming uplift in chemical stock prices—linked to rising profits—may spur industry growth rate

Expected gains in chemical companies' earnings during this second quarter show promise this week of helping chemical stock prices snap out of a 14-month lethargy that has had heavy significance for the industry's expansion and financing programs.

While prices of most other industries' stocks have been climbing fairly steadily through the "Kennedy bull market" that has prevailed—at times rather shakily—since last November's election, chemical stock prices on the whole have been notoriously slow on the uptake (*chart, above*). And chemical management—by its candor in discussing the cost-price squeeze that has made for "profitless prosperity" over the past year—has contributed to Wall Streeters' impression that the chemical industry has largely lost its formerly high earnings potential.

Since the economic slowdown started about one year ago, chemical stock prices—reversing their usual role—have been consistently weaker than the all-industry average on the New York Stock Exchange. And the price index for industrial chemical stocks was bent down again last fortnight when the Supreme Court ruled that Du Pont must dispose of its lucrative investment in General Motors (*CW, June 3, p. 21*).

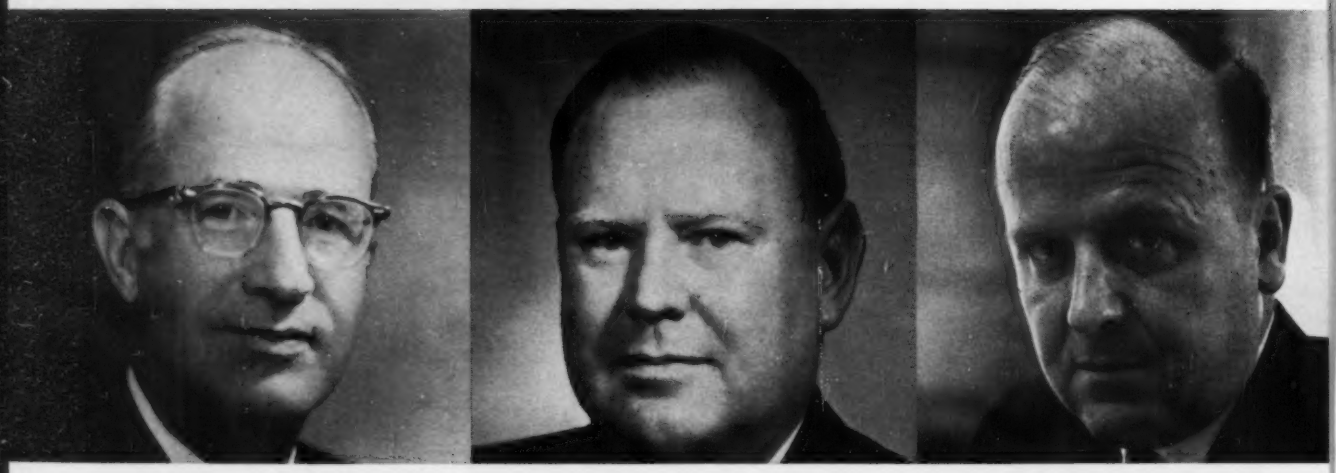
Many Exceptions: But the financial community is not entirely disenchanted with chemicals. Per-share prices of more than 40 chemical stocks have increased by at least 50% since last year's low-water marks; and for nine of those stocks, the increase has been 100% or more (*table, p. 24*).

In some cases, these run-ups have reflected the fact that there is much venturesome capital in the stock market these days—so much so that the president of the "Big Board," Keith Funston, has seen fit to publicize several warnings against over-impulsive speculation in relatively low-priced, high-risk stocks.

But in other cases, investors have flocked to buy stock in chemical companies that have simply been doing a good job in conventional product lines.

One such example: W. R. Grace & Co., now a preponderantly chemical company, which has not been a trail-blazer in either of its principal chemical operations. With the growing realization that President W. R. Grace's plastics and fertilizer projects are paying off, the price of Grace stock advanced from last year's $35/share low to a $70/share high thus far in '61.

Dixie Success Story: Another company that has won recognition on Wall Street for making a go of its



Air Products' Pool, Southern Nitrogen's Riley, W. R. Grace's Grace and Bzura's Bzura: Prices of their

fertilizer materials business: Southern Nitrogen Co. (Savannah, Ga.), headed by President John R. Riley. Price of its common stock last fall was about $9/share; but last week it was quoted at $18.50 bid, $19.88 asked.

Wall Street had been a bit bearish about this company, noting that it had relatively high long-term debt, that it was still several million dollars in the red after five years of operation, and that there was considered to be an overcapacity for nitrogen fertilizers in the U.S. Now it's conceded that this company has done "an excellent job" of establishing itself in the Southeastern market, that it has made rapid growth in sales, and that with nitrogen prices up its earnings potential is much enhanced.

Most of the other chemical companies whose stocks have doubled in price within the past six to eight months are in what Wall Street currently regards as "glamor fields."

Earnings Up 57%: In cryogenics, investors are particularly keen on Air Products Co. (Allentown, Pa.), which is planning to merge with Southern Oxygen Co. (*CW Business Newsletter, April 22*). Their enthusiasm has boosted the price of its stock from a 1960 low of $35/share to more than $70 this spring. President Leonard Pool has estimated that per-share earnings for the fiscal year ending Sept. 30 will be up more than 57% to at least $2.20; and he adds that the company intends soon to list its stock—now traded over-the-counter—on the New York Stock Exchange.

A Wall Street favorite in refractory metals is Kawecki Chemical Co. (Boyertown, Pa.), which went to the money market last month to sell nearly $3.4 million worth of convertible debentures and which is planning a two-for-one stock split (*CW, May 20, p. 24*). Price of Kawecki stock dipped below $40/share last year, but last week was selling at $90.

Enjoying investors' esteem again after a year or two out of favor is Metal Hydrides, Inc. (Beverly, Mass.)

Where Wall Street Sees 'Glamor'

Principal chemical products of companies whose stock prices have doubled since 1960

Company	*Fertilizers*	*Industrial Gases*	*Industrial and Specialty Chemicals*	*Photographic and Photocopying Products*	*Plastics and Resins*	*Refractory Metals*
Air Products		Oxygen, other gases, and oxygen plants				
Anken Chemical				Films, papers, chemicals		
Atco Chemical			Aminophenols, coatings, solvents, fuel additives, etc.			
Bzura Chemical			Fumaric and citric acids, castor beans			
Grace, W. R.	Ammonia, urea, superphosphate, phosphoric acid and ammonium phosphates				Polyethylene, polypropylene, polystyrene, packaging films and equipment	
Great Lakes Chemical			Bromine, ethylene dibromide, methyl bromide			
Kawecki Chemical						Tantalum, columbium, master alloys, other metals and compounds
Metal Hydrides			Sodium borohydride, potassium borohydride, lithium aluminum hydride, etc.			
Southern Nitrogen	Ammonia, urea, ammonium nitrate, nitrate-limestone					

stocks have doubled in six months.

A revival of interest in borohydrides has sparked a 100% rise in the price of its stock to about $18/share in recent trading period.

Photocopying Vogue: Graphic arts companies are in vogue on Wall Street this season, and riding the crest of this wave is Anken Chemical & Film Corp. (Newton, N.J.) Expansions, acquisitions, and joint ventures have aroused investors to boost the price of Anken stock more than threefold, to about $73/share in the past six months.

Three relatively small producers of industrial and specialty chemicals also have seen their stock prices double since last year. Price of shares in Hyman Bzura's Chemical (Keyport, N.J.) has more than doubled, to $23; price of stock in Atco Chemicals-Industrial Products (Hoboken, N.J.) has shot up more than four-fold, to more than $8; and price of Great Lakes Chemical (Los Angeles) stock has more than tripled, to about $4/-share.

On the average, chemical stock prices now are about what they were in the booming first half of 1960, and nearly 12% higher than their 1957-'59 average. But most chemical companies' sales and earnings potentials have increased even more than 12% since then; and with earnings expected to surge this quarter, many financial analysts are advising investors to take a new look at chemical stocks. In turn, renewed confidence in chemical stocks on the part of investors could be a strong stimulus for the industry's growth planners.

Multiple Mergers

Three mergers in different CPI areas, each involving several companies, have been approved with an eye toward expansion of output in two cases and of markets in the third.

Rubber, Plastics, Chemicals: Stockholders of Baldwin Rubber Co. (Pontiac, Mich.), Montrose Chemical Co. (Newark, N.J.) and Centlivre Brewing Co. (Fort Wayne, Ind.) have agreed to a three-way merger forming Baldwin Montrose Chemical Co. Baldwin and Montrose will operate as divisions; Centlivre will be sold to its employees.

The move will give Baldwin a broader base and an anticipated greater sales volume. Montrose will boost its research activities and gear its output to supply Baldwin's operations.

Baldwin makes automotive rubber products other than tires; its subsidiary, Mono-Sol Corp. (Gary, Ind.) produces plastic foam and films, including water-soluble packaging materials for household bleach. Montrose makes plasticizers and organic chemical intermediates, and is a leading DDT producer through a subsidiary jointly owned with Stauffer Chemical Co.

The new company, which plans further acquisitions, will form a committee to coordinate the rubber, plastics and chemical divisions. Combined sales last year were about $30 million. The Montrose affiliate added another $18 million. Stockholders have approved a proposal to list common and preferred shares on the American Stock Exchange.

Paper: Georgia-Pacific Corp. (Portland, Ore.) has expanded its paper-converting facilities by adding Royal Container Co. (San Francisco) and its subsidiary, Royal Fiber Corp. (Santa Clara, Calif.), through an exchange of stock.

Royal Container has two plants, one at Milbrae, Calif., and a new one at Buena Park, Calif. Both have corrugators for making boxes and specialties from kraft liner board supplied by G-P's Toledo, Ore., mill. Capacity of each is 30,000 tons/year. Royal Fiber's plant turns out 36,000 tons/year of similar products.

Acquisition was by issue of 80,000 shares of G-P stock (current market value: about $5.8 million).

Urethane Foam: Nopco Chemical Co. (Newark, N.J.) has acquired six Midwest foam companies from D & W Clark Corp. (Chicago) for 30,000 shares of Nopco common stock, valued at about $1.6 million. Two of the acquired concerns are in Illinois, one each in Indiana, Nebraska, Colorado and Minnesota. Although some production facilities are involved, main aim is to give Nopco increased sales and distribution outlets in the Midwest, which will pave the way for a new foaming and fabricating plant the company expects to have onstream in the area by December.

Crossing the Channel

Another British chemical company is putting one foot in the European Economic Community (EEC). Laporte Industries Ltd. (London) — a holding company whose subsidiaries include Laporte Chemicals, Laporte Acids, and Laporte Titanium—is acquiring Elektrochemische Werke Muenchen AG. (Hollriegelskreuth, West Germany) for $4.2 million in cash plus an exchange of stock shares.

Earlier this year, Imperial Chemical Industries—Britain's largest chemical producer—revealed that it plans to invest $280 million in new plants in the six Common Market nations during the next 10 years, starting with a petrochemical plant in The Netherlands (*CW, March 11, p. 25*).

Elektrochemische — a major producer of hydrogen peroxide, other peroxides, persulfates and chlorites—has been doing well, with 1960 sales up 15.4% to $4.7 million; but its electrolytic hydrogen peroxide process has become obsolete. The 11 stockholders — including E. Merck AG. (Darmstadt) — were facing the necessity of buying a license and investing heavily in new equipment. Instead, they offered their holdings to Laporte, also a big producer of hydrogen peroxide and other peroxy chemicals, which has a modern production process.

Thus Laporte—which is now using a sodium chlorite process it obtained from Elektrochemische—gains an already profitable foothold in the Common Market, and the German stockholders are shifting their investment from a small company with one product line to a large, relatively depression-resistant chemical empire.

Putnam's Moody: Dyestuffs maker follows its customers South.

Dyestuffs for Dixie

Two dyestuffs companies are moving South this week, following their textile-making customers. Cheaper Southern labor costs, which drew the textile makers, aren't too important to dyestuff makers, who simply seek the advantages of being close to their markets.

Belle Chemical Co.—now based at Reading, Pa.—plans to move to a site between Lowell and Gastonia, N.C. It will build what it calls the South's first fully integrated plant for producing dyes and pigments. First to go up will be a $400,000, 45,000-sq.ft. textile dye and chemical plant, due onstream Sept. 1; units at Womelsdorf and Reading, Pa., will be closed down.

Putnam Chemical Co., the U.S. dyestuffs arm of Germany's Badische Anilin & Soda Fabrik AG, is shifting headquarters from Beacon, N.Y., to Charlotte, N.C. Putnam mainly distributes Badische dyes, although it manufactures some. The first phase of its new set-up will be a $300,000, 17,000-sq.ft. laboratory and office building. Next will come an 18,000-sq.ft. manufacturing and warehouse facility. Putnam President Leon Moody expects both to be ready for use by early '62.

The two moves point up a current concern of U.S. dyestuff producers: the determination of foreign dye makers to battle for U.S. markets. Putnam, essentially an importer, has lost little time in moving close to the big Southern textile plants.

The dye business, closely tied to the ailing textile industry (*CW Report, April 15, p. 69*), has felt the cost-profit squeeze to the point where it hurts. One way to ease this might be diversification—or so Belle hopes. It plans additional units to make pharmaceutical intermediates, pigments for paper, leather and paint and possibly the extraction of metals from columbium and titanium ores. No time schedule is given for completion of the move.

Putnam plans to make its move south as gradual as possible, will retain its Beacon, N.Y., location as a sales office. In effect, it is reversing the roles of two locations it already had, making the former headquarters a subsidiary office.

There has been a general movement of textile makers from points in the Northeast to the South, encouraged by lower labor costs and subsidies from state governments. Suppliers, such as dyestuff makers, are finding themselves forced to follow.

Booming in Bulk

Two coming plants reflect fertilizer trends: the big swing to bulk blending (*CW, Oct. 15, '60, p. 21*), and prospects for steadily rising volume in future sales seasons.

International Minerals & Chemical Corp. will build a $3.8-million diammonium phosphate plant at Bonnie, Fla. The plant will produce 100,000 tons/year of 18% nitrogen, 46% P_2O_5 material, is due to be onstream Oct. 31.

Northwest Co-operative Mills, Inc. —a fertilizer complex owned by a group of Midwestern farmers' co-ops (*see p. 5*)—will build a $4-million plant at Pine Bend, Minn., to produce 100,000 tons/year of water-soluble ammonium phosphate. Due onstream: middle of next summer.

Behind the move to ammonium phosphates: the trend to bulk marketing. Blending in bulk is easier when only two materials, instead of three, are involved. (Ammonium phosphate and potash supply all the basic nutrients.) Bulk blending offers lower cost because of its easier handling, no need for bags.

Behind fertilizer makers' expansive mood: two weeks of balmy weather thus far in the midst of the crucial planting season.

Celanese's Blancke: He sees 19% rise in sales, 56% gain in profits.

Gauging the Upturn

Celanese Corp. President Harold Blancke provides an early indication of the improvement in chemical industry operations in this second quarter. For Celanese, Blancke predicted before the New York Society of Security Analysts last week, second-quarter sales and earnings will be up 19% and more than 56%, respectively, from their first-quarter levels.

For 1961 as a whole, Blancke told a questioner, Celanese looks for sales and earnings to be fully equal to last year's marks.

During the past five years, he related, Celanese has invested $98.6 million in new plants and equipment —43% for chemicals, 30% for fibers, 27% for polymers and plastics—and those capital expenditures are expected to generate sales of about $110 million this year. Over the five-year period starting with '61, he went on, capital expenditures are projected at about $140 million—33% for chemicals, 30% for polymers, 28% for fibers, and 9% for plastics.

Blancke said $26.8 million would probably be put into plant and equipment projects this year—mostly for the new petrochemicals plant at Bay City, Tex., expected to begin production by next spring, and for the Celcon acetal copolymer plant at Bishop, Tex., which is now slated for startup sometime before the end of the current year.

Foreign companies with which Celanese is affiliated now have 18 plants in Canada, Latin America and Japan,

Blancke noted. He said total sales of those affiliates amounted to $97.2 million, and the Celanese share of their earnings was nearly $6.2 million. Dividends received from the foreign affiliates amounted to more than $1.3 million, leaving not quite $4.9 million in unremitted earnings. Net assets of those affiliates as of last Dec. 31 was listed at $172.2 million, in which Celanese had a nearly 76% equity.

Blancke said the company now employs 985 scientists and engineers—an increase of 75% in the past five years. In that same period, total assets rose nearly 20%, to $401 million; sales increased by 40%, to $264 million; and pre-tax earnings have risen 60%, to $37 million. Products introduced during the past five years account for 20% of current sales volume. Domestic plants now have capacity for sales of $350 million/-year, he added.

Phosphates for Israel

Israel's government-owned Negev Phosphates Co. is joining 50-50 with several unspecified foreign chemical concerns to launch a three-year, $20-million expansion of its Oron phosphate mines near the Dead Sea. This will be the first private financing in the field.

The venture includes construction of a $2-million phosphate-derivatives plant, $7-million soda ash plant, and a $5-million fertilizer unit. Capacity: 200,000 tons of phosphate derivatives; 60,000 tons of soda ash; 140,000 tons of concentrated phosphate fertilizers, and some animal feed additives.

Another new instalation will produce 100,000 tons/year of triple superphosphate for export. (Fertilizers Co. of Haifa now produces 120,-000 tons of superphosphate annually for home use.)

Seventy percent of output will go to Europe and Far East. Facilities will utilize Negev's new process for low-cost phosphate benefication by removal of calcium carbonate.

One foreign firm will handle marketing, another production, a third will provide capital. A Swiss concern is operating on behalf of the foreign interests (reportedly one British, one German and one American) to protect them from possible Arab economic reprisals.

Break for Alberta Sulfur

Fred Ronicker, plant manager of Texas Gulf Sulfur Co.'s Okotaks, Alta. plant, like other Candian sulfur men, is wondering this week whether the new rail rates will be enough to allow movement of the piles of sulfur (below) to Pacific overseas markets. The 22.2% reduction, from 45¢ to 35¢/cwt., was less than the producers had hoped for (they wanted a 25¢ rate), may not keep them in those fiercely competitive markets for long.

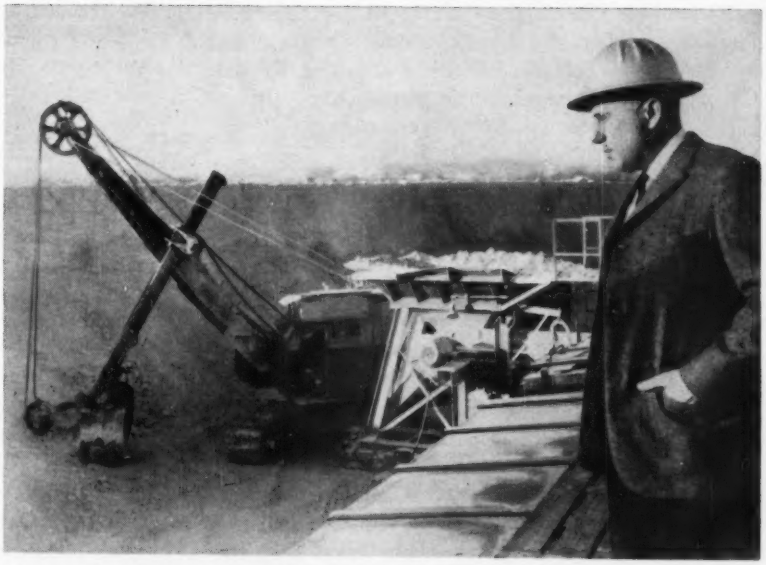
For the present, it should enable the Canadians to sell about 200,000 long tons/year of the sulfur in the Pacific area (a market they are not in at all now), about 15-20% of expected total production. Initial customers: India, Formosa, Australia, New Zealand, Hawaii.

The sulfur, a byproduct of the sweetening of Alberta sour gas, has been largely unsalable because it was too far away from sulfur markets; freight rates put the price too high. But the new rates will barely make it competitive: sulfur from other areas now sells for $31/ton in India; and Alberta sulfur, although only $10.80/-ton in the gas fields, costs plenty to ship abroad: rail charges to Vancouver are $7.84, port handling charges are $1.37, ocean transportation costs $10, and the Indian agent's fee is about $1. Total: $31.01.

The new rates apply only to shipments from Alberta to Vancouver, and are not unusually low—most Canadian chemicals move at "agreed" rates that are relatively lower. Such special treatment is often granted if the producer can convince the carrier that he can compete with U.S. producers only with the aid of a lower rate. In return, the producer signs a long-term contract.

Alberta's sulfur producers, however, have not signed an agreed rate contract. They have two reasons for not signing—(1) they haven't been able to prove that they will take business away from the U.S. and thus ship a greater total of sulfur on Canadian rails. (2) they have hopes of getting a sulfur slurry pipeline, so don't want to be tied to rails. If a pipelining method is found, producers may build one line to the Chicago area, another to the West Coast.

The new freight rates won't benefit all Alberta sulfur producers. Cost of production varies from $4 to $11/-ton, depending on the analysis of the gas, the process, the importance of the sulfur in the economics of the individual operation. Some producers feel they need a rate as low as 25¢/100 lbs., but concede that the railroads probably can't move material at that rate, would need a government subsidy (as is provided for coal moving to Japan).



Texas Gulf's Ronicker: Will new rates move the sulfur to market?

national roundup

Rounding out the week's domestic news.

Companies

Air Reduction Co. (New York) and **Speer Carbon Co.** (St. Marrys, Pa.) are planning to join forces. If the terms proposed by the two managements are approved by both companies' directors and stockholders, Airco will acquire Speer by exchanging one share of Airco common stock for each 2.25 shares of Speer common. This move would add about $25 million/year to Airco's sales volume, greatly broaden its product line.

Atlas Chemical Industries (Wilmington, Del.) has completed its acquisition of The Stuart Co. (Pasadena, Calif.), producer of ethical pharmaceuticals (*CW, April 1, pp. 17, 22*). A stock split is effective with the merger: four shares of Atlas Chemical for each share of Atlas Powder (the company's former name).

Chemtron Corp. (Phillipsburg, N.J.) has changed its name to Pearsall Chemical Corp. The company operates plants in Brainards, N.J., Sarnia, Ont., and La-Porte, Tex., producing aluminum chloride, zinc chloride, chlorinated paraffin waxes, copper sulfate and ferric chloride.

National Starch & Chemical Corp. (New York) has acquired Kleen-Stik Products (Chicago), which produces pressure-sensitive labeling papers, foils and films. National manufactures packaging and structural adhesives, vinyl acetate polymers and copolymers.

Richardson Co. (Melrose Park, Ill.), producer of industrial rubber and plastic products, has moved further into the chemical field by acquiring Krystall Chemical Co. (Chicago), which manufactures surface-active chemicals for the detergent industry.

Expansion

Petrochemicals: Wyandotte Chemicals Corp. plans to construct a $3.5-million propylene oxide plant for its Michigan Alkali Division at Wyandotte. Output will be used by the parent company to manufacture detergents and flexible and rigid urethane foams.

Polyethylene Film: Kordite Co. (Macedon, N.Y.), division of National Distillers & Chemical Corp., is installing equipment to produce polyethylene film and bags in a building it has purchased in Tyler, Tex. The new unit, Kordite's first Southwestern plant, is due in operation next month and will also handle polypropylene before year's end.

Carbon Black: Columbian Carbon Co. (New York) plans to construct $2 million worth of additional facilities to produce carbon black at its North Bend, La., plant.

Barium Hydroxide: FMC's Mineral Products Division (New York) plans to construct facilities to produce barium hydroxide monohydrate at its Modesto, Calif., plant. The unit is due onstream late this year. FMC now produces barium oxide, hydroxide pentahydrate and hydroxide octahydrate at the Modesto plant.

foreign roundup

Rounding out the week's international news.

Fertilizer/UAR: The United Arab Republic's Economic Development Organization, state-owned holding corporation controlling many of the country's mining and industrial concerns, is studying possible manufacture of ammonium sulfate fertilizers from gypsum deposits recently found in Sinai peninsula.

Plastics/India: Indian Plastics Ltd. has been licensed by Ruetgerswerke AG (Frankfort, Germany) to produce resins and molded plastics. The German firm will also lend technical assistance in the planned expansion of Indian Plastics' plant in Kandivli.

Tall Oil/Netherlands: Naarden-Kemi, a new firm, has reached agreements with two foreign companies and will build a tall-oil fractionating plant north of Amsterdam. Kemi Oy (Finland) has agreed to supply raw tall oil, and Union Bag-Camp Paper Corp. (Savannah, Ga.) will provide technical assistance. Project, due onstream in '63, will cost the equivalent of $1.7 million.

Farm Chemicals/U.K.: Dow Chemical Co. (Midland, Mich.) has acquired all the shares of its British subsidiary, Dow Agrochemicals Ltd. Dow previously owned 74%, with the rest in British hands.

Oxygen, Nitrogen: General Dynamics' Liquid Carbonic Division (Chicago) has broken ground for a new liquid oxygen-nitrogen plant in Tewksbury, Mass., to supply its expanding New England market. American Messer (New York) will construct the plant. The new facility, which will produce high-purity liquid nitrogen, liquid oxygen and liquid argon, is expected onstream next January.

Unloading a column for Kuwait Oil Co.'s LPG plant, which will help diversify the Sheikdom's exports.

Kuwait Tries Its Luck at Chemicals

Kuwait's may be the first of petrochemical ventures by Middle Eastern countries.

Tiny Kuwait is probably the only country in the world that has a problem spending all its money. Chances now seem good that investment in chemical process industries will help solve the Arab Sheikdom's enviable "problem" of spending its fabulous oil revenues constructively and diversifying its economy.

On May 12, Kuwait's ruler, Sheik Abdullah as-Salim as-Sabah, signed a decree authorizing the government's Finance Department to form a petrochemical producing company with Oronzio de Nora Associates, Kuwait National Petroleum Co., and Kuwait Industrial Co., a new mixed government-private company now making building materials.

The consortium plans to start construction in October of '61—when the hot season is over—and have "the first stage" onstream in mid-'63. This will be units capable of turning out, over-all, 200,000 tons/year of caustic soda and chlorine, urea and polyvinyl chloride, from natural gas and petroleum by-products. This is not a giant complex, but one of substantial size. Possibly two years later, the project would move into its second stage, producing more complex chemicals such as synthetic rubber and chlorinated products, as well as carbon black.

The new company—Kuwait Petrochemical Co. Ltd.—will be capitalized at $45 million. Oronzio de Nora Associates and the government, through its Finance Dept., will each

Kuwait's ruler, Sheik as-Salim as-Sabah, wants to build up industry.

have a 40% interest, while K.N.P.C. will hold 5% and Kuwait Industrial Co. 3%. The remaining 12% is being offered to the Kuwaiti public.

Oronzio de Nora Associates is comprised of Oronzio de Nora, an Italian chemical engineering company, and a group of its "friends and associates." So far, these include only European and South American interests, but Vittorio de Nora was in New York last week talking to at least one U.S. company about participating.

Despite its minority share, the Italian company will be the kingpin of the planned project. It will design and build the plants, then manage and operate them, de Nora says.

Embarrassment of Riches: Kuwait's "financial problem" stems from the fact that, with a population of less than 300,000 and a territory about the size of Connecticut, it's the biggest oil producer in the Middle East. Oil revenues last year came to $400 million. Added to that are many more millions made by local merchants and contractors, and the income on foreign investments piled up by the ruling family and the government. These investments have been financed by surplus funds collected in the ten years that Kuwait has been a major oil producer.

Unlike the governments of other oil-rich Middle Eastern states, Kuwait's rulers have spent lavishly on development projects — on schools, hospitals, highways, housing, sea water distillation plants, and a $30-million harbor. In the current fiscal year $150 million has been budgeted for development projects. But, outside of the petroleum field, no important industry has been established. And non-industrial development has reached a stage where not all the money earmarked for public works can be used. Experts estimate that within five years Kuwait will run out of development projects to invest in, unless it turns to industrialization.

Private investors face the same problem of finding solid ventures. Having built all the mansions and palaces they want, and saturated the speculative real estate market in Kuwait and Beirut, the Sheiks of the ruling dynasty and the wealthier merchants have now turned to banking, insurance and shipping ventures, at home and abroad.

When the government offered to the public 40% of the shares of Kuwait National Petroleum Co. — the country's first national oil company— the issue was oversubscribed eightfold in a few days.

Picking the Project: The problem is selecting industries that will make sense in Kuwait's situation — a tiny home market surrounded by vast underdeveloped areas (*see map, p. 32*).

To find the answer, the Finance Dept. recently set up an Investment Board, headed by Feisal Mazidi, one of the rising young foreign-educated officials in the government. Guidance is supposed to come from a report of the World Bank mission which has just returned from Kuwait, where it conducted the country's first comprehensive economic study.

"Industrial planning in Kuwait shouldn't be difficult," Mazidi told a *CW* correspondent recently. "Our population is small, our economy is simple, our natural resources—oil and gas—are well defined. So is our income. What we have to do is to plan capital expenditures. That's where we hope the World Bank mission will help us and draw up a list of priorities."

How much weight World Bank suggestions really carry with Kuwait is the question. A World Bank consultant reportedly made a petrochemical feasibility study and advised against starting a petrochemical venture for the present. The Finance Dept. rejected this advice and asked de Nora to do an independent study, which led to the project.

Kuwait's abundant oil and gas have yielded two major assets for industrialization—plentiful capital and cheap power. But working against these advantages is the small local market and Kuwait's distance from high-consumption areas.

Moreover, there is a lack of technical know-how, and—unlike the situation in other Mid-Eastern states—labor is expensive. "Our best bet, therefore, is to set up industries with relatively high power costs," Mazidi believes.

Mid-East Aluminum? In line with this, the government is negotiating with Reynolds Metals to set up a 50,000 tons/year aluminum plant, which would use alumina from Africa. This would involve a capital investment of $42 million, with Reynolds, the Kuwait government, and local private interests contributing.

Later, the government would like to produce its own alumina from imported bauxite, which would mean a further $25-million investment. That part of the plan is considered less feasible by industry observers, since it would mean importing twice as much bauxite for each pound of aluminum produced, compared with importing alumina, without compensating power cost savings.

In another possible venture based on low-power-cost economics, the Kuwait Finance Dept. is discussing with a West German firm the design, engineering and construction of an iron and steel mill, using iron ore imported from India and Goa. It would use the Austrian LD process.

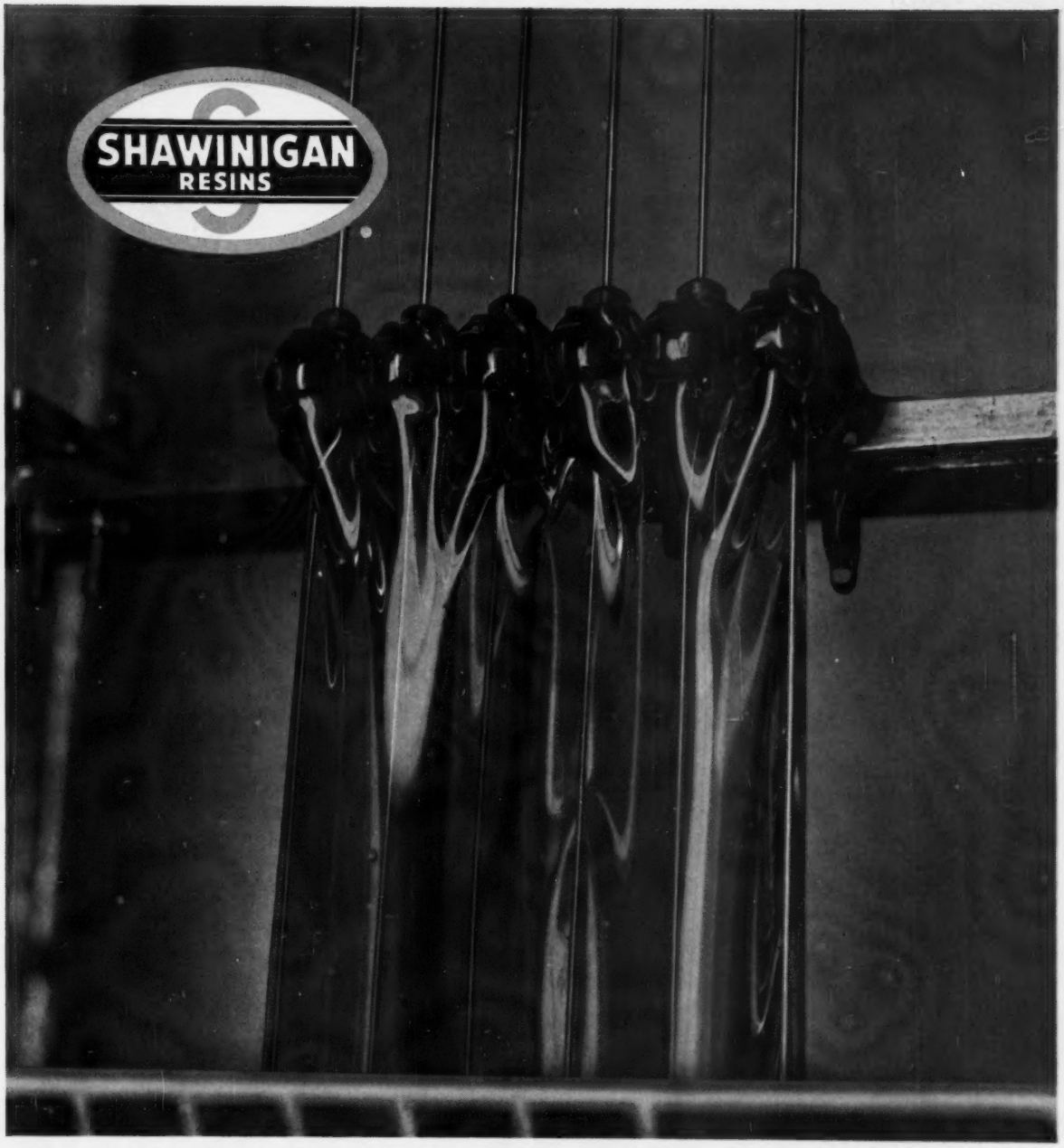
Petrochemical Prospects: But the industrial projects nearest to the heart of Kuwaitis are in petrochemicals. Although millions of cubic feet per day of natural gas are used for power, sea water distillation, and fuel, millions more are simply being flared off. This waste pains the Kuwaitis, especially since the gas is of exceptionally high quality. It consists of about 80% methane, is almost free of hydrogen sulfide, while nitrogen and carbon impurities are less than 0.5%.

Other Arab states—notably Saudi Arabia—have had the same thoughts. Concerned by declining crude oil prices, they want to upgrade their exports. At the Second Arab Oil Congress in Beirut last October, 24 of the 68 papers presented dealt with petrochemicals, utilization of natural gas, and refinery processing.

But so far they have been unsuccessful in interesting the international petroleum companies in their plans. The producers maintain that the local markets are too small for economically scaled plants, and that it would be difficult competing against established producers in other markets. The latter use much of their output themselves, can ride along with price fluctuations, are closer to customers, can offer technical service, etc.

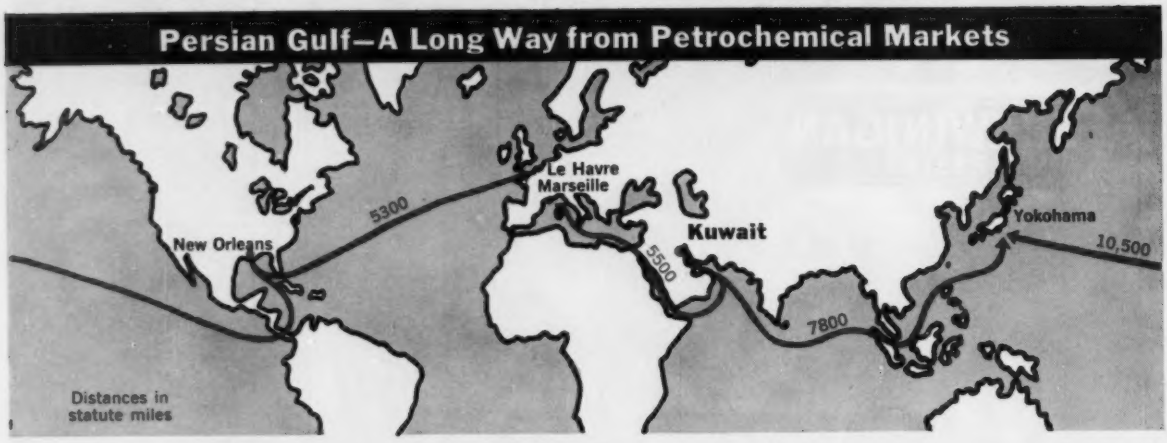
The backers of the new Kuwait project brush off such criticisms, attributing them to Western fear of competition from the Middle East, and to Western companies' reluctance to invest in the area.

Some experts believe that a petrochemical project would be more feasible economically in Iran or Saudi Arabia, which have the agricultural



START OF A BETTER MOTOR The insulating enamel on magnet wire is the critical factor in electric motor performance. That's why motor manufacturers rely on the rugged dependability of enamels based on FORMVAR® polyvinyl formal resin. For more than 20 years, FORMVAR® based enamels have provided a balance of unsurpassed physical, chemical, and electrical properties. FORMVAR® Resins and new FORMETIC® Enamel are typical examples of Shawinigan's creative research. As specialists in polymer chemistry, we are solving problems and improving products in such varied fields as electrical products, building products, paper, textiles, adhesives, pharmaceuticals, and surface coatings. The answer to your coating or bonding problem is probably in our more than 60 resins, emulsions, and solutions. Or we'll custom-develop it for you. For complete technical details, please write to Department 16.

Shawinigan Resins Corporation, Springfield 1, Massachusetts



potential that Kuwait lacks. Their reasoning is based on the assumption that the economic feasibility of a project would depend heavily on finding local markets for the fertilizer output.

But Kuwait, has one advantage that can be critical in the stormy Middle East: it's the most stable of all the Arab oil states, has been making a smooth transition from its status of a British protectorate to full independence.

And de Nora insists that the new project's output will be competitive. He points out that its justification is based on the fact that none of its raw materials—gas, salt, and air—will have to be imported, that no waste products will be involved. The natural gas will be processed into hydrogen and acetylene. The hydrogen will be used to make ammonia, which in turn will be converted into urea. And the acetylene will be chlorinated to vinyl-chloride.

Although the fertilizer output will be greatest in terms of value, de Nora says, the project doesn't depend on marketing any one product. Next in order of value will be the polyvinyl chloride, then the caustic.

No marketing contracts have been signed, but de Nora says they have studied the markets thoroughly, and know where the output will go. Most of the urea is slated to be sold for the rice fields of South East Asia. The PVC is aimed primarily at Europe. And the caustic and chlorine will be consumed entirely within the Middle East—principally by the Reynolds aluminum project. Smaller amounts of the plant's output will go to East Africa and South America.

The project's backers admit that transport costs to some markets and labor costs will be relatively high, but they maintain that this will be offset by the low power costs and the free supply of high quality natural gas available only a few miles from the plant site outside the capital city of Kuwait.

Reluctant Investors: Despite the government's enthusiasm over petrochemical prospects, Kuwait's powerful merchant class has not been quick to risk any capital in the venture. Known for their shrewd business acumen developed through centuries of Indian Ocean trade, they are chary of putting up any money without assurance of a reasonable return on their investment.

A group of them recently proposed that a thorough study be made of Kuwait's petrochemical possibilities before starting any costly project. And since Iran, Iraq, and Saudi Arabia also have petrochemical ambitions (but not the capital), Kuwaiti businessmen have also proposed that these countries make a joint study and draw up a coordinated program for the whole Persian Gulf area.

But experts write off chances of such cooperation emerging in the Middle East. More likely, competing plants will spring up, and more than one country may be disillusioned about the magic of petrochemicals.

Saving Gas: Meanwhile, other steps are being taken to cut the waste of Kuwait's natural gas. The country's major crude producer, Kuwait Oil Co. (owned 50-50 by Gulf and British Petroleum), has completed Kuwait's first gas injection plant—a $4.2-million unit. It will compress and reinject more than 100 million cu. ft./day of gas back into the Burgan oil reservoirs to maintain pressure and store the gas for future use.

But the most ambitious gas utilization project actually under way is the 6000 bbls./day LPG production and export plant Kuwait Oil Co. is building at Mina Ahmadi. It's scheduled to start in September, and to start loading operations on specially built tankers for export to Japan in November. British Petroleum has a contract to supply Japan's Bridgestone Tire Co. with refrigerated LPG from the plant before year end.

First Chemical Output: Also under construction is a small chlorine and caustic plant—the first chemical plant in Kuwait and, aside from a small oxygen plant and sea water distillation units, the only one in the whole Persian Gulf area.

Using concentrated brine from nearby sea water distillation plants, it will have an initial capacity of 2 tons/day of chlorine, which is designed for doubling. Its output will replace the chlorine now being imported by the government from Western Europe, Japan, and India for the sea water plants. The caustic will also be used locally.

Besides being Kuwait's first chemical plant, the chlorine plant is also the first chemical project designed and supervised by an Arab engineering firm—Dar Al-Handassa, of Beirut. The company is also designing a 3 ton/day hydrochloric acid plant for the government.

Both the caustic and the hydrochloric acid will be consumed locally.

These projects are significant steps. But the petrochemical and aluminum projects will be the real tests for the future pattern of Kuwait's industrial development.

This pump can give you a price advantage!

The Goulds-Pfaudler glassed pump cuts pump replacement and maintenance costs for many companies making cosmetics, drugs, plastics, paints and other products requiring abrasive or corrosive pumpage. In these industries, where pump life is normally measured in months—or weeks—the Goulds-Pfaudler pump lives on and on.

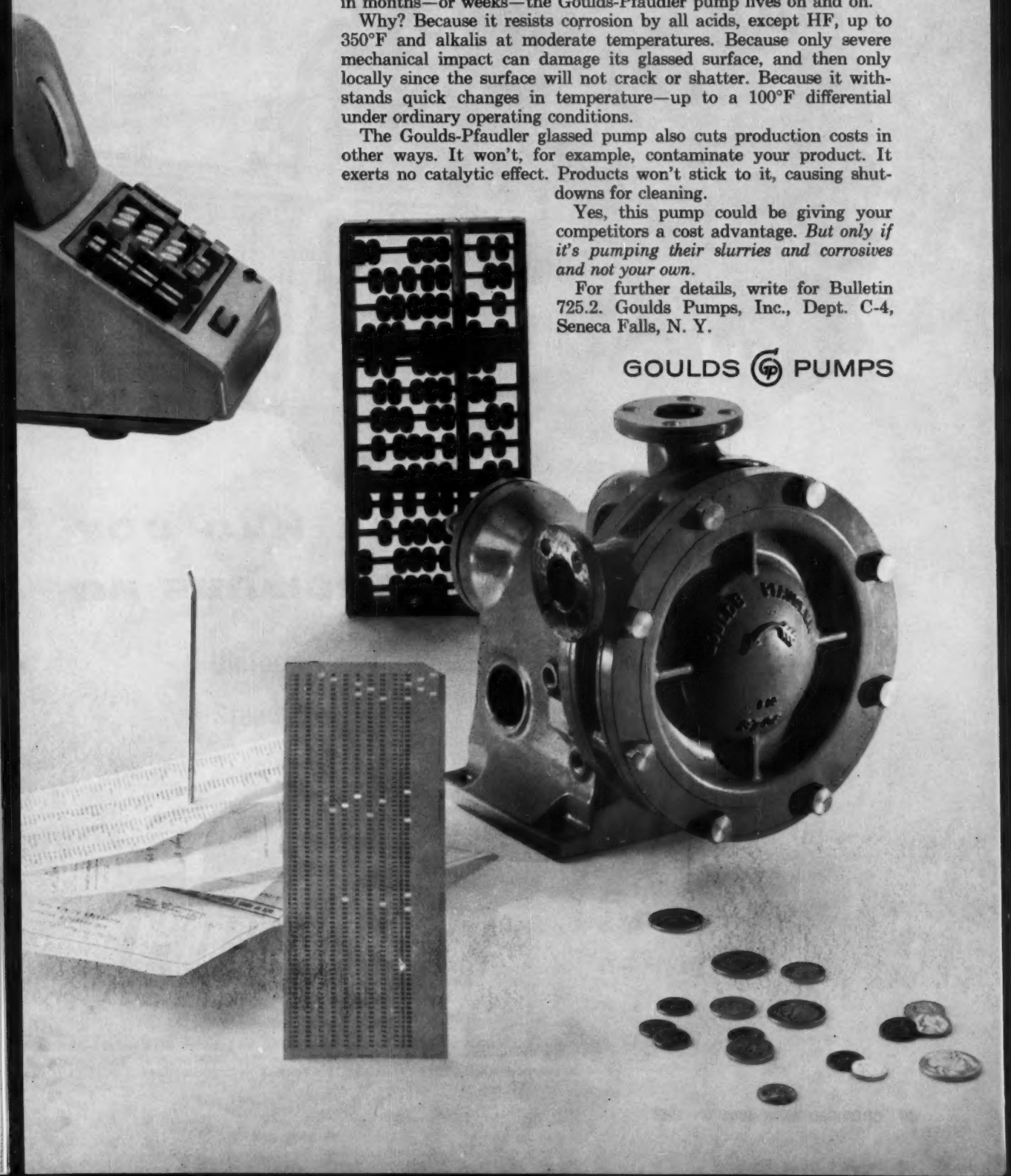
Why? Because it resists corrosion by all acids, except HF, up to 350°F and alkalis at moderate temperatures. Because only severe mechanical impact can damage its glassed surface, and then only locally since the surface will not crack or shatter. Because it withstands quick changes in temperature—up to a 100°F differential under ordinary operating conditions.

The Goulds-Pfaudler glassed pump also cuts production costs in other ways. It won't, for example, contaminate your product. It exerts no catalytic effect. Products won't stick to it, causing shutdowns for cleaning.

Yes, this pump could be giving your competitors a cost advantage. *But only if it's pumping their slurries and corrosives and not your own.*

For further details, write for Bulletin 725.2. Goulds Pumps, Inc., Dept. C-4, Seneca Falls, N. Y.

GOULDS PUMPS



YOU CAN DEPEND ON PUBLICKER FOR

Uniform Quality—
Steady Supply—
Prompt Delivery!

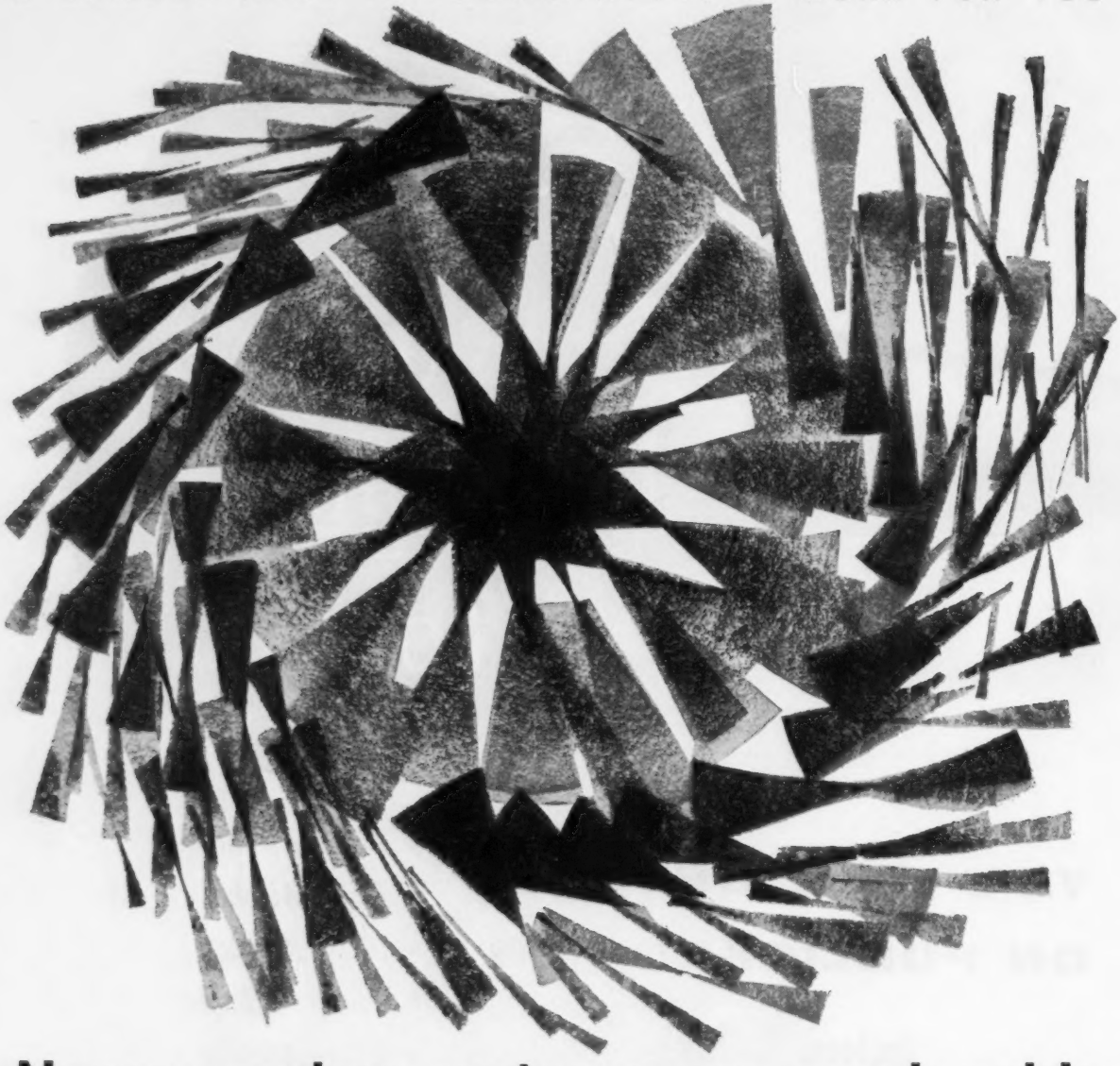
- ★ *Ethyl Alcohol*
- ★ *Butyl Alcohol*
- ★ *Butyl Acetate*
- ★ *Butyl Chloride*
- ★ *Ethyl Acetate*
- ★ *Amyl Acetate*
- ★ *Acetone*
- ★ *Acetic Acid*
- ★ *Refined Fusel Oil*
- ★ *Isoamyl Alcohol*
- ★ *Acetaldehyde*
- ★ *Proprietary Solvent*
- ★ *Thermice brand of CO (gas, liquid, solid)*

Publicker

INDUSTRIES INC.
1429 Walnut Street, Philadelphia 2, Pa.

LADELPHIA—LOCUST 4-1400 • *NEW YORK AND NEW ENGLAND: PUBLICKER ALCOHOL & CHEMICAL ES CORP.* • NEW YORK—OXFORD 5-4160 • BOSTON—HOMESTEAD 9-0022 • *MIDWEST: PUBLICKER EMICAL CORP.* • CHICAGO—RANDOLPH 6-1557-8-9 • ST. LOUIS—PROSPECT 6-0858 • NEW ORLEANS—MORE 7-1486

A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU



Nopco makes water more serviceable

Millions of dollars in research and over 50 years' experience have made us chief water chemist to a dozen different industries. By way of example, Nopco surfactants help household and industrial cleaners get behind the grease. Nopco defoamers help roll out reams of spotless paper at high production rates. Nopco emulsions impart bond strength and specific adhesion to latex products and lubricity to water in wire drawing. Whatever your operation, if water is basic to it, you can count on Nopco ingenuity to change its characteristics to suit you.

For further details, see Chemical Materials Catalog

Lubricants
Detergents
Plasticizers
Softeners
Emulsifiers
Dispersants
Wetting Agents
Defoamers
Stabilizers

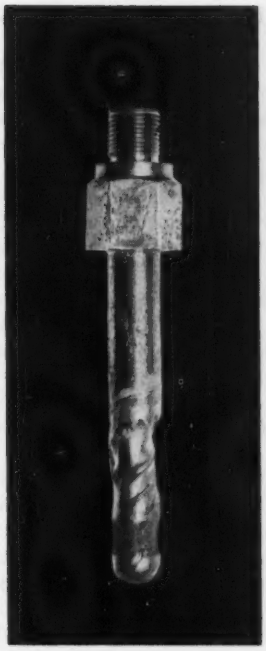
NOPCO CHEMICAL COMPANY

60 Park Place, Newark, N.J.

Plants: Harrison, N.J. • Carlstadt, N.J. • Richmond, Calif. Cedartown, Ga. • London, Canada • Mexico, D.F. • Corbeil, France • Sydney, Australia

NOPCO®

Manufacturing Licensees Throughout the World



Wear—exemplified by the deformed shaft (right)—costs the chemical industry over $400 million/year in repairs and replacements. New abrasion-resistant materials and improved maintenance methods can cut the tab.

Taking Up New Cudgels in the Fight on Wear

The chemical process industries' growing use of heavy, high-speed process equipment has one big drawback: parts wear out faster—sending the cost of repairs and replacement soaring to over $400 million/year. But this expense may have reached its zenith as a result of stepped-up research, new construction materials, and a changing maintenance attitude within many chemical companies.

For example, Du Pont's Mechanical Research Laboratory has launched a research program to discover the basic causes of wear by studying individual crystals of metal oxide. And a number of chemical companies are carrying out government-sponsored research to find oxidation-resistant coatings for missiles—coatings that may eventually be used to solve chemical industry wear problems.

In fact, the CPI is already using recently developed flame-coated metals. And Union Carbide's Linde Division has just opened its third flame-plating plant at North Haven, Conn., to handle growing business.

Spurring the new developments has been a major change in plant maintenance department personnel and techniques. In the past the non-technically trained staff predominated and serious wear problems were often overlooked. Periodic replacement of worn parts was considered normal plant maintenance, says Wyandotte's Lou Gleekman.

But the influx of large numbers of engineers into the maintenance ranks has focused attention on the wear problem, sparked a searching look at its high cost. Preventive maintenance programs (*CW, Sept. 13, '58, p. 41*) and streamlined record-keeping, such as the use of business machines by U.S. Industrial Chemicals at Tuscola, Ill. (*CW, Feb. 25, p. 41*), are showing management for the first time the staggering cost of worn parts—about 25% of the plant maintenance bill.

And the total cost of wear easily tops the $400 million that is paid out for repairing and replacing worn parts. The rise of continuous processing has meant that a worn part can shut down an entire process, and the typical cost of an emergency process shutdown today is in the neighborhood of $4,500.

Set Apart: Aggravating CPI's wear problem is the hazard of product contamination, which adds to costs and sets it apart from the wear headaches confronting other industries. Metal particles from the worn parts may degrade the chemical product. And lubricants used by many industries to cut wear, can't be employed because they might contaminate the product. Frequently the process fluid, itself, must be used as the lubricant. Also, because it is not designed primarily for lubrication, the process fluid may cause parts to wear out more quickly.

Du Pont has helped to reduce its wear problems by using precision optical instruments to accurately align mechanical parts (*CW, July 23, '60, p. 40*). The company's Engineering Service Division consultants estimate that more than 50% of the time spent on machine alignment can be performed using optical techniques. And now the company is out to further reduce wear with an entirely different approach.

Its Mechanical Research Laboratory is attempting to strike at the heart of the problem by investigating the fundamentals of wear. Roelos Steign is working with individual crystals of alumina (aluminum oxide) to find out how the orientation of the crystal planes affects wear resistance. Proper orientation of the crystals in a part, such as an insert in a bearing or seal, might increase the life of the part.

But even the fundamentals can be complex. Ward Myer, director of the MRL, lists four basic factors that affect wear: the atmosphere in which the part must operate, the effects of

corrosion on grain boundaries, the effects of friction and surface hardening.

In a corrosive, oxidizing atmosphere, a metal oxide is formed on the part. The abrading medium strips away the oxide, gradually reduces the metal itself.

When corrosion attacks the grain boundary of the metal, the grain is weakened. Friction then causes the grain to scale off. Friction alone can also gradually reduce the amount of metal in a part. And it can cause surface hardening—the cold working of metal particles against each other, which results in embrittlement so that pieces of metal easily chip off the part.

New Coatings: Du Pont's MRL group is using single crystals of alumina because they are more stable than other crystals, have less tendency to break down into a number of crystals and have good chemical resistance. Therefore, it is no coincidence that alumina, which is one of the flame-coated materials being used in missile research, is already being supplied by Linde as a coating for mechanical seals in chemical plant applications.

The big advantage of flame coating or plating, according to Malcom Barnes, Linde's flame-plating manager, is the combination of abrasion and corrosion protection it affords. The flame coating (e.g. alumina) may have good chemical resistance, but its primary advantage is abrasion resistance. The base metal can provide the corrosion resistance that may be required in severe atmospheres. For example, pinholes in the coating, which at times can't be avoided, will not materially reduce the abrasion resistance of the coating. But, if the base metal is not abrasion resistant, it may be attacked, eaten away beneath the coating.

In addition to Linde, which provides a complete flame-plating service, other companies, such as Metco Corp. (Westbury, N.Y.) and Giannini Plasmadyne Corp. (Santa Ana, Calif.), offer flame-plating equipment. Others, such as Norton (Worcester, Mass.), offer flame-plating raw materials (*CW, Nov. 26, '60, p. 45*).

Standard materials may cost from about $4 to well over $100/lb. But the amount of material used in flame-coating is usually small; the cost of applying the coating is the big cost factor. For example, North American Aviation's Rocketdyne Division figures it can flame-coat steel rocket motor nozzles for about $10.20 on a production basis; the cost of the alumina used is only about 15-20¢.

Stumbling Block: However, regardless of the new materials of construction and the basic research into wear mechanisms, potential solutions to wear problems must still be tested. And simulated plant tests often prove to be the stumbling block.

Preliminary screening to reduce the list of potential materials is sometimes easily accomplished with the aid of equipment makers and materials of construction experts. But plant engineers often mistakenly believe that tests can be carried out easily by using fluid from the plant process stream. Du Pont's Myer points out the pitfall of this approach: in the test, the recycling of the process stream often causes the abrading material itself to breakdown physically and chemically, giving misleading results.

While simulated plant tests can't replace actual plant trials, they can help in the final screening of materials and aid in determining the critical wear factors that may be eliminated by minor changes in the plant process stream. For example, Farbenfabriken Bayer is now using an electrostatic precipitator not only to improve liquid chlorine purity, but also to prevent accumulation of salt particles in the working parts of compressors (*CW, June 3, p. 83*).

Commercial wear-testing machines, such as those made by Faville-Le Valle Corp. (Chicago) and Alpha Molycote Co. (Stamford, Conn.) can often be used in simulated plant test programs. But sometimes homemade devices are just as effective. Many of these devices circumvent the problems of using actual process stream material, give relative wear resistance of parts by merely simulating the type of wear that would occur in the process stream.

Radioactive tracers are sometimes used to determine the minute amounts of worn metal that is picked up by the process stream.

The complexity of the wear problem requires the teamwork of plant and research engineers who are experts in their field. The chemical industry has made a good start, but has a long, rough road to travel.

Training in Miniature

Polyvinyl Chemicals, Inc. (Peabody, Mass.) recently completed a lecture series for employees that should be encouraging to the small chemical company. The point it proved: a company doesn't have to be large to develop a training program tailored to its needs.

A small firm that manufactures emulsion polymers, Polyvinyl wanted to give its 40 employees a comprehensive, clear understanding of its operations. And, the company wanted to give the operators additional tools, such as the theory of slide rule operation and plant control procedures, that might help them perform their jobs more effectively.

It set up a series of 12 lectures during working hours for each of its two shifts, to be attended on a voluntary basis. Henry Merken, a research and development engineer at the plant and an evening instructor at Lowell Technological Institute, worked out the lectures and presented them. The most difficult task: presenting basic polymerization theory related to Polyvinyl's processes in a manner that could be understood by the employees.

Merken, who instructs advanced-degree college students in high-polymer chemistry, devised sets of poppet beads which he uses as visual aids in explaining the various types of polymers (e.g., linear, branched chain, crosslinked). But he admits that simple explanations often aren't easy to come up with. In fact, eight of the 12 lectures had to be devoted to polymerization theory. And, it was decided to cut down lecture frequency from biweekly to once a month.

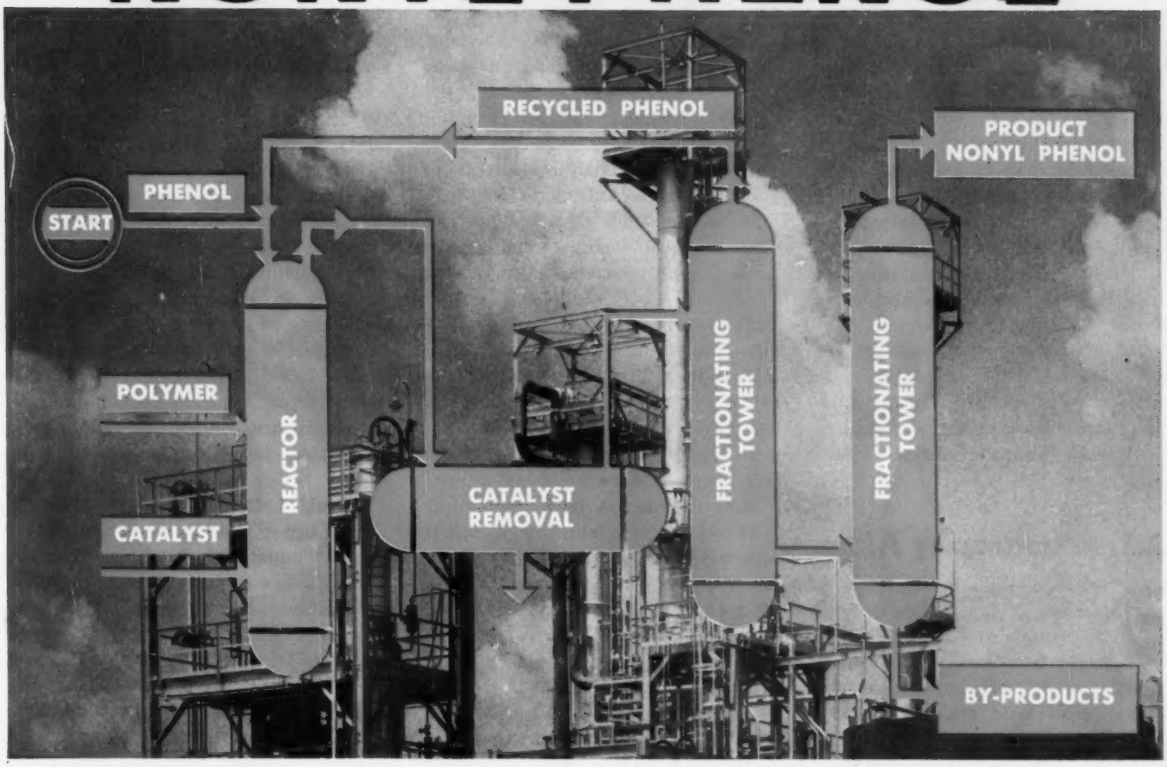
"The thing we didn't want to do was confuse the employees. In hitting on the idea of a lecture series in the first place, we were trying to eliminate confusion that we were afraid may have developed.

"In making the rounds of the plant over the years, I have answered many individual questions of the workers. But this created the problem of their putting unrelated answers together and jumping to the wrong conclusions," Merken says.

Skills developed in instructing college evening classes enabled Merken to question employees during the lectures to determine how well the the-

HARDWORKING JEFFERSON CHEMICALS

NONYL PHENOL



Continuous process assures uniformity

Jefferson's special *continuous process* for producing Nonyl Phenol, on stream since 1959, assures you of a uniformly high quality product in any quantity you require.

Nonyl Phenol is a mixture of monoalkyl phenols, predominately para substituted. The side chains are random-branched alkyl radicals. This alkyl phenol is insoluble in water and dilute aqueous caustic, but soluble in benzene, chlorinated solvents, aniline, heptane, aliphatic alcohols and ethylene glycol. Some of the applications are: an intermediate in anionic and nonionic surface-active agents; a starting material for lubricating oil additives, stabilizers, petroleum demulsifiers, oil-soluble phenolic resins and plasticizers.

Write for free Technical Brochure . . . Jefferson Chemical Company, Inc., 1121 Walker Avenue, P. O. Box 303, Houston 1, Texas.

SPECIFICATIONS

Specific gravity	0.94 min.
20/20°C.	0.95 max.
Hydroxyl number	245 min.
	258 max.
Color, Pt-Co scale	100 max.
Boiling range, ASTM, °C.	
IBP:	283 min.
95%	302 max.

SELECT PROPERTIES

Pour point	2°C.
Refractive index, N_D20	1.513
Flash point, (TOC), °F.	300
Dielectric constant, 3500 kc, 23°C.	5.0

HOUSTON • NEW YORK • CHICAGO • CLEVELAND
CHARLOTTE • LOS ANGELES • SAN FRANCISCO

JEFFERSON CHEMICALS

004

ory was being grasped. But no formal quizzes were given.

Indications of the success of the series: several employees want to further their formal education; there was 100% attendance throughout the series.

The fact that the employees ask more questions about plant processes than they did before the lectures is another indication of the series' success, Merken adds. And the employees appear to have more confidence in going about their jobs.

Polyvinyl expects to continue the series for new employees and as a refresher for older employees—particularly when plant processes undergo revisions. And, Merken has already received inquiries from other firms in the New England area on details of how the lecture series was set up.

Chromatography Aid

This week, Phillips Petroleum Co. revealed details of a new data system that speeds up chromatographic analysis. The system enables high-speed chromatographic equipment to be set up within an hour, have data completely printed in less than 30 seconds after a two-minute, 14-component analysis.

Previously used systems required experimental trial-and-error techniques that usually take 2-30 days of laboratory work to establish optimum conditions for high-speed separations of volatile components.

In the new system, Phillips has set up basic chromatographic information in chart form. This chart is used with theoretical equations that the company has developed for calculating the optimum design and operating conditions of a chromatographic column from a minimum amount of experimental information. When a component mixture is received for analysis, the system permits rapid calculation of the best partitioning liquid and percentage to be used, the flow rate, pressure drop, temperature, column length and minimum time for performing the analysis.

After the column is set up, the instrument system controls the chromatograph, integrates each component peak of the chromatogram and prints the normalized, total analysis in digital form.

EQUIPMENT

Data Handling Systems: General Electric's Computer Dept. (Deer Valley Park, Phoenix, Ariz.) is now offering two new data collection and transmission systems for small factories. One, the 3100 Shoptrol system, is designed to eliminate production schedule paperwork, provide long- and short-range work analysis information, accumulate payroll and inventory data. The system's work stations send information to status monitors at a control center by means of paging selectors.

The other unit, called the 3101 Data Collection system, converts the information from dials or punched cards to electrical signals which can be recorded on punched tape for computer input.

•

Rubber Hose: A new type rubber hose for loading abrasive materials into barges is being made by B. F. Goodrich Industrial Products Company (Akron). The hose, called Convertapipe, was tested for 15 months, piping 600 barrels/hour of cement under conditions described by BFG as equivalent to sand blasting at temperatures up to 200 F. More than one-half million barrels of cement were loaded during the test. A conventional wire reinforced hose lasted 2 months in the same service.

•

Cryogenic Valve: A new cryogenic valve with an extended bonnet to minimize heat transfer is being made by Cooper Alloy Corp.'s Valve & Fitting Div. (Hillside, N.J.). The valve's packing gland is placed outside the cold box for accessibility.

The standard line includes most gate and globe types, available on three weeks delivery (after extension length is specified), precision lapped discs and extra heavy stems. The valve comes in type 304 stainless steel and 1 to 8 in. sizes, with flanged or butt-weld end connections.

•

Water Sampler: The Aquator, a water sampler that collects at a fixed rate (about 2 qts. in 24 hrs.) is a new product of Princeton Division of the Curtiss-Wright Corp. (P.O. Box 110, Princeton, N.J.). Typical sample use: to determine the amount of contaminants in water. Its makers claim the sampler needs no attention, is more reliable and less time-consuming than grab sampling. The unit collects at 17-30 in. depths, has a 1 gal. capacity, a 15½ in. float, a 39½ in. height.

•

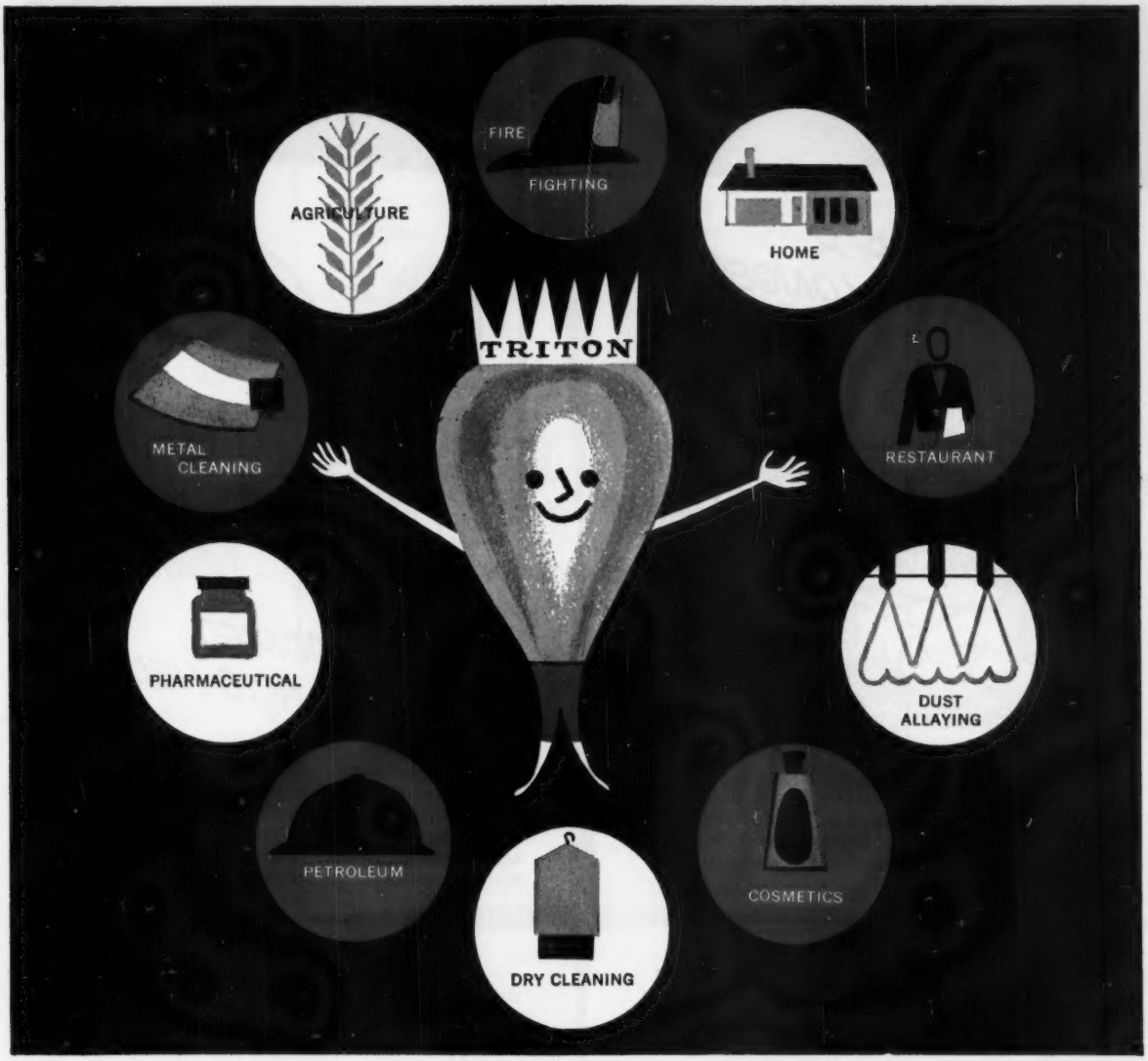
Collapsible Crane: A completely collapsible crane is being offered by W. B. McGuire Engineering Co. Ltd. (P.O. Box 265, Champlain, N.Y.) for general maintenance and materials handling. Called the Versacrane, it has a number of components which can be used individually or in combinations. Included: two platform trucks to carry the components; six ladders (including two attached to the trucks); 1-ton McGuire chain block mounted on an L-Beam stretched between the two mobile ladders; an adjustable work platform supported by the mobile ladder uprights.

•

Liquid Lathe: Abrasi-Jet Machine Tool Corp. (Glendale, Calif.) is offering a "liquid lathe" which delivers a needle-like stream of liquid under several thousand pounds of pressure for cutting through cement, wood and plastic. The device, developed by North American Aviation's Los Angeles Division and licensed through its Navan invention marketing subsidiary, was designed especially for safe cut-away of high-energy solid propellant from rocket engine casings. Abrasi-Jet is developing models for cutting and shaping metals and other materials.

•

Ceramid-Metal Composites: Pfaudler Permutit Inc.'s Pfaudler Co. Division (Rochester 3, N.Y.) is now offering its Nucerite, ceramic-metal composites, on a production basis for equipment of simple, uniform cross-section and no sharp corners. When introduced last fall (*CW, Sept. 24, '60, p. 47*). Nucerite was still in the laboratory development stage. Parts now in the production stage: 6-in. diameter pipe, 2½-in. diameter boiler tube, 6⅝-in. diameter bayonet heater, 12- and 18-in. diameter columns, 300-gal. closed-top reactor, finger baffles, and rings and flanges for electrical barriers in pipe lines. Ceramic-metal composites using carbon steel as the metal substrate will withstand operating temperatures in the 450-700 F range; stainless steel, Inconel and refractory metals can be used for temperatures between 750 and 1,500 F.



Surfactants for any formulation

The TRITON® surfactant family offers both oil-soluble and water-soluble products as well as some partially soluble in both oil and water. Designed to give your cleaning compounds the exact characteristics needed, it includes high and low foamers, defoamers, coupling agents and emulsifiers. TRITON surfactants are available in the Octylphenol and Nonylphenol nonionic series. In addition, anionic, cationic, quaternary ammonium compounds and amphoteric products help make a family whose members supply effective solutions for most formulation problems. Rohm & Haas research is constantly developing high quality new products to help keep you in the lead with your detergents. Competitively priced TRITON products have been proved effective for uses ranging from home to heavy industry. Extensive data has been compiled on each. Write for samples, literature and formulating help.

ROHM & HAAS

PHILADELPHIA 5, PA.

TRITON

Progress with FATTY ACIDS

SANDPAPER LASTS LONGER

A metallic salt of Stearic Acid is being used to increase the life of sandpaper for woodfinishing. Treating the sandpaper with zinc stearate apparently prevents the fine wood particles from building up and prematurely clogging the abrasive surface.

WELL-GROOMED AND OLEIC ACID HELPED

His detergent soap . . . liquid shampoo . . . and hair dressing depend in part on derivatives of Oleic Acid for their effectiveness. Amine soaps of this fatty acid provide good detergent action, act as non-ionic emulsifiers and emollients in many cosmetic formulations.

MORE COLORING FUN

Stearic Acid keeps crayons from going limp in little fingers. It imparts hardness and non-melting characteristics, also serves as a pigment binder. Shades stay true, whites won't yellow.

Below are facts you should know about two Fatty Acids produced by A. Gross. Why not write us for samples and additional information on these and other Fatty Acids we produce. Send for the latest edition of the brochure "Fatty Acids in Modern Industry". Address Dept. CW-5.

Specification	GROCO 57 HYDROGENATED TALLOW F.A.	GROCO 2 1°–3°C. TITRE OLEIC ACID
Titre	57°–59°C.	3°C. max.
Titre	134.5°–138°F.	37.4°F. max.
Color 5¼" Lovibond Red*	2.0 max.	1 max.
Color 5¼" Lovibond Yellow*	10 max.	10 max.
Unsaponifiable	0.75% max.	1.5% max.
Saponification Value	204–207	198–203
Acid Value	203–206	197–202
% F.F.A. as Oleic Acid		99 min.
Iodine Value (WIJS)	4–6	95 max.
Refractive Index 50°C. (Av.)		1.4505

*1" cell for GROCO 2

a. gross & COMPANY

295 MADISON AVENUE • NEW YORK 17, N. Y.

Factory: Newark, New Jersey • Manufacturers Since 1837

Washington
Newsletter

CHEMICAL WEEK
June 10, 1961

Exports of chemicals and related products dropped sharply in April, according to the Commerce Dept. The latest figures show that this category of exports dropped from $158.6 million in March to $141.1 million in April. Over-all, U.S. exports declined 12% between March and April, with the largest decreases occurring in machinery and vehicles, textile fibers and manufactures, vegetable food products and beverages, metals and manufactures, and chemicals and related products.

•

AEC has reduced basic charges for enriching natural uranium in the fissionable U-235 isotope. Lowering of prices for reactor fuel will have the effect of putting nuclear power in a stronger competitive position with conventional energy sources. Government and private atomic experts hope that the decreased prices will bring substantial encouragement to the lagging nuclear power industry.

Price cuts include a 20% reduction for highly-enriched uranium and a 34% reduction for 1% enriched uranium. Simultaneously, however, AEC slightly increased the use charge. The net effect of both actions will be to reduce operating costs of a 300 megawatt single-cycle reactor about 0.3 mills per kilowatt hour. Experts feel this may amount to as much as a $500,000/year saving.

•

President Kennedy is worried about possible price increases during the next 18 months as the business recovery gains momentum. He has asked Government economists to prepare a case against steel price increases in case industry decides to go through with its rumored boost. If the Administration's plan works in steel, it will be similarly used in an effort to block prospective price rises in chemicals, drugs and other industries.

What Kennedy wants to avoid is a recurrence of anything like what happened during the 1955-57 business boom. The cost of finished goods used in production rose 18% in that period. There is no serious thought of formal price controls—even in drugs. The President will use information supplied by his economists to arouse public pressure against excessive wage or price rises.

•

The Administration also will intervene in labor disputes if it feels they threaten to delay the business recovery. This is in direct contrast to the Eisenhower Administration, which generally maintained a hands-off policy. The new policy was elucidated by Secretary of Labor Arthur J. Goldberg last week when he said a strike in the auto industry would be "intolerable."

Goldberg apparently will not hesitate to use the new White House labor-management advisory committee as public leverage if a

Washington Newsletter

(Continued)

strike in a key industry seems imminent. This may prompt some union leaders to hold out during negotiations, hoping for a break from Goldberg. This probably will not be forthcoming, however, since the White House committee is equally concerned about wage boosts and price increases.

•

Kennedy's plan to retrain workers displaced by automation appears headed for Congressional approval. The amount involved is relatively small—$60 million—and objections will be few so long as the unemployment rate remains at the present high level of 6.9%. Many chronically unemployed have been displaced as a result of automation. The Kennedy proposal would provide federal funds for training these workers, both on-the-job and at vocational schools, for periods up to one year. Funds also would be used to relocate workers.

•

The Senate is cutting back the anti-pollution program approved by the House—but only slightly. A bill voted on by the Senate Public Works Committee calls for construction grants to states and communities totaling $440 million over the next five years for waste treatment plants. The House bill authorized a $1-billion, 10-year program.

The Senate measure also would limit federal matching grants for a single sewage plant project to $500,000, compared with $800,000 authorized by the House. Either way, a considerable increase in the present $50-million/year federal program can be expected to come out of Congress this year. Any compromise also will give the Health, Education and Welfare Dept. more authority to force communities to comply with anti-pollution laws.

•

Reorganization of the Federal Trade Commission, as proposed by President Kennedy, has run into a minimum of opposition in Congress. The plan will go into effect on July 8 unless it is vetoed by either the House or Senate. This now seems unlikely, despite the opposition of Republican Commissioner Sigurd Anderson. He says the plan invests too much power in Chairman Paul Rand Dixon, former Chief Counsel for Sen. Kefauver's Antitrust and Monopoly Subcommittee.

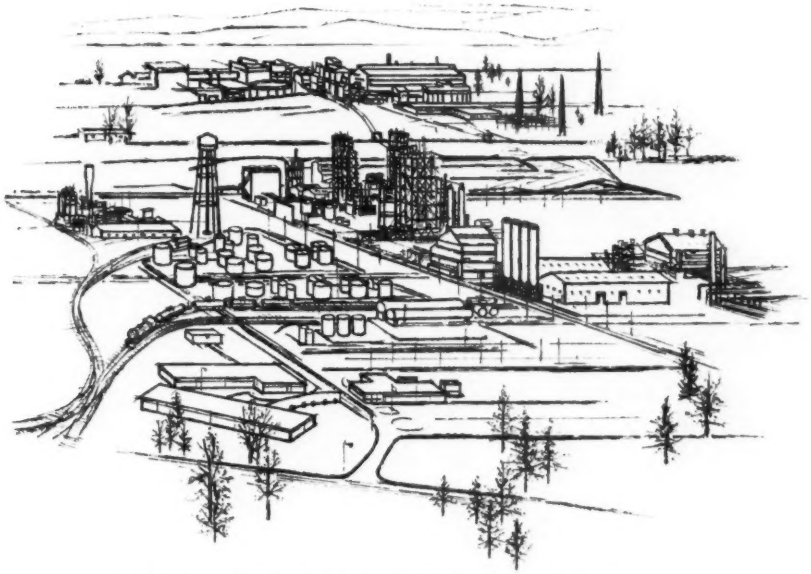
•

The U.S. is in a tariff dilemma in negotiations being conducted in Geneva under the General Agreement on Tariffs and Trade (GATT). The six-nation European common market has offered to cut tariffs 20% on all non-farm products. Britain is considering a similar move—if all other signatories to GATT do likewise.

U.S. delegates can make no such promises. Under peril points established by the Tariff Commission, they can pledge no more than an average 5% reduction—far short of the 20% goal. But U.S. representatives still hope that the European countries will make substantial cuts—remembering earlier bilateral reductions made by the U.S.

AIRCO

AIRCO ORGANIC CHEMICALS / COLTON POLYMERS



Airco's calcium carbide plant at Calvert City (background) provides acetylene by pipeline to the Airco chemical works (foreground) and to the nearby chemical works of B. F. Goodrich and General Aniline & Film.

AIR REDUCTION CHEMICAL & CARBIDE CO.

A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED

150 EAST 42nd STREET • NEW YORK 17, NEW YORK

Colton Polymers for industry

Applications

Flexbond®—Copolymer polyvinyl acetate emulsions

grade	description
800	Very flexible, high molecular weight
802	Adhesive base for synthetic films; excellent machining properties
803	Permanent flexible adhesive base; polyvinyl alcohol stabilizer
811	Flexible, high molecular weight
855	Fine particle size; high flexibility; wide spectrum adhesive base
306	Vinyl acetate/acrylic; excellent pigment binder, excellent flexibility

Vinac®—Polyvinyl acetate homopolymer emulsions

grade	description
XX-210	Highly adhesive, wide compounding stability, solvent tolerant, quick setting
XX-220	Similar to XX-210, with higher viscosity
HF-300	High original viscosity, thickens rapidly on compounding
WR-50	Clear, water-resistant films; borax stable
CE 1-P	Special concrete adhesive and admix
RS-100	Alkaline soluble emulsion; dry film can be resolubilized by alkali or ammonia
AA-63	Eliminates solution separation of fully hydrolyzed PVA adhesives; superior water resistance; excellent mechanical stability

Flexac—Polyvinyl acetate homopolymer emulsions

grade	description
FA-5	High molecular weight, clear, excellent film former at low temperatures
1256	Binder for boxboard printbase coatings with high pick resistance, good printability, low odor level, excellent light stability

Vinac—Polyvinyl acetate beads (resin in solid form)

grade	description
B-7	Small, glass-like spherical beads; non-blocking on storage, without refrigeration. All pass 8-mesh screen, dissolve readily in wide range of solvents. Films are clear, glossy, non-toxic, water resistant.
B-15	
B-25	
B-100	
B-600	
ASB-10	

Vinac—Spray dried powder

grade	description
RP-250	White, redispersible polyvinyl acetate powder. Good adhesive properties.
RP-251	Similar to RP-250. Formulates into a premium product with high binding properties, free from caking in transit or in storage.

ADHESIVES					PAINTS			TEXTILES			COATINGS			
paper	cloth	plastics	leather	concrete	exterior	interior	primer-sealer	non-woven binder	finishing	sizing	heat seal	grease proof paper	paper base	board base
●	●	●	●		●	●	●							
●	●	●	●		●	●	●							
●	●	●	●								●			
●	●	●						●	●		●	●		
●	●	●	●		●	●	●							
●	●	●	●			●	●	●	●			●	●	●
●	●		●	●				●	●	●	●	●	●	●
●	●		●	●				●	●	●	●	●	●	●
●	●									●	●			
●	●			●	●	●	●	●	●	●	●	●		
				●										
●	●									●				
●	●		●											
●	●													●
●	●		●			●	●	●	●	●	●	●		●
●	●		●											
●	●		●											
●	●		●											
●	●		●											
●	●		●											
●	●	●	●					●		●	●		●	●
●	●		●											
●	●		●							●	●			
●	●		●							●	●			

Colfoam®* Microballoon®** Spheres

Tiny spheres of urea-formaldehyde resin, Colfoam Microballoons find interesting applications in the petroleum and plastics industries.

Petroleum industry—Colfoam Microballoons were developed specifically to reduce evaporation losses from crude oil tanks. Chemically unreactive in the presence of petroleum-type hydrocarbons, Colfoam Microballoons form a thick layer of foam which acts as a continuous vapor barrier.

Plastics industry—Colfoam Microballoons reduce the overall weight and expand the bulk of light-weight foams. They reduce shrinkage and impart tear strength, low density, and increased viscosity in latices.

Aircoflex DBP Dibutyl Phthalate

Compatible with most synthetic polymers and natural resins, Aircoflex DBP is an excellent plasticizer for emulsion paints, coatings, finishes and adhesives. Available in drum quantities, and in mixed compartment tank car and tank wagon shipments from Elkton, Maryland.

*Registered trade name of Air Reduction **Registered trade name of Standard Oil (Ohio)

NOTE: All emulsions supplied at pH 4.0-6.0, except Flexbond 306, which is 6.5-8.0 in dispersion.

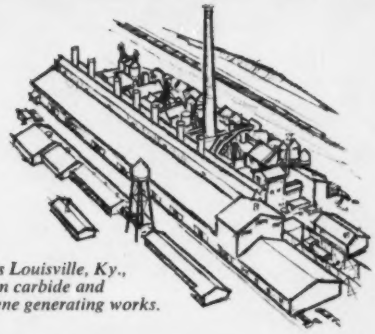
Surfynol®—Nonionic Surfactants, Dispersants, and Defoamers

The SURFYNOLS are unique ditertiary acetylenic glycols which combine surface active and defoaming properties not found in other nonionics. In combination with other surface active agents (whether nonionic, anionic, or cationic) SURFYNOLS show synergism, i.e., exhibit greater activity at a given concentration than either material alone at the same concentration.

Excellent high temperature stability is a characteristic of the 100% active, solid SURFYNOLS, 82 and 104.

trade name	chemical composition	% active by weight	surface tension 0.1% aq. soln., dynes/cm, 25°C	applications
SURFYNOL 104	Ditertiary acetylenic glycol	100	31.6	Increased wetting and low foam with other surface active agents; defoamer in aqueous systems; rinse-aid surfactant.
SURFYNOL 104A	Solution of 104 in 2-ethyl hexanol	50	33.0	Defoamer in emulsion systems for paints, paper coatings and textile finishes; insecticide formulations; low-foam detergents.
SURFYNOL 104E	Solution of 104 in ethylene glycol	50	33.2	
SURFYNOL TG	Mixture of ditertiary acetylenic glycol, alkyl phenyl ether of polyethylene glycol and ethylene glycol	83	27.6	Pigment dispersion in emulsion paints and other pigmented aqueous systems.
SURFYNOL 61	Dimethyl hexynol	100	32.4 (1.0% aq. soln.)	Volatile wetting agent for paper coatings, floor polishes and glass cleaning formulations. Viscosity reduction.
SURFYNOL 82	Dimethyl octynediol	100	55.3	Viscosity reduction in vinyl plastisols and aniline inks. Cosmetic ingredient. Low-foam wetting agent in developer compounds. Defoamer in electroplating baths.

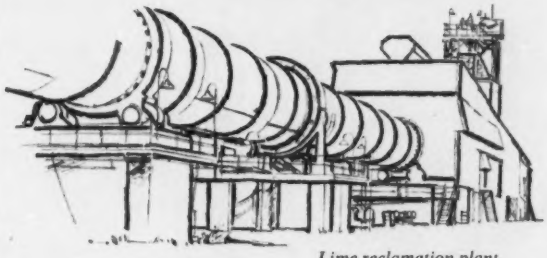
Acetylene for chemical use



Airco's Louisville, Ky., calcium carbide and acetylene generating works.

A leader in the production of acetylene for chemical synthesis, Air Reduction pioneered the development of the chemical manufacturing complex at Calvert City, Kentucky. Airco's calcium carbide plant supplies high-purity acetylene by pipeline to nearby chemical plants. These customer plants at Calvert City manufacture a wide range of vinyl monomers, polymers, surfactants, alcohols, and derivatives. A similar Airco calcium carbide and acetylene-generating installation at Louisville, Kentucky, supplies acetylene by pipeline to two adjacent plants—a major neoprene plant and a large vinyl chloride plant. Further information on obtaining pipeline acetylene at these sites, or at other locations, may be obtained from Air Reduction Chemical & Carbide Company, 150 East 42nd Street, New York 17, N. Y.

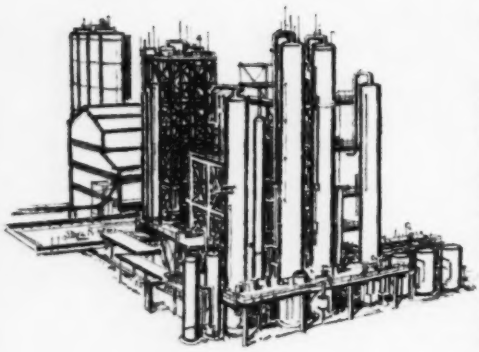
Calcium Carbide and Lime Hydrate



Lime reclamation plant, Calvert City, Ky.

Air Reduction also manufactures calcium carbide at Ivanhoe, Virginia, and Keokuk, Iowa. Airco's "National Carbide" calcium carbide meets the highest specifications for acetylene yield. "National Carbide" ® calcium carbide is available in a range of lump sizes and container sizes, designed for the convenience of the welding industry.

A by-product in the manufacture of calcium carbide, lime hydrate from Air Reduction Chemical & Carbide Company is available in an exclusive spray-dried form. Economical to ship and to handle, spray-dried lime hydrate is recommended as a causticizing agent for the aluminum and paper industries; a low-cost neutralization agent for acid wastes; an acid neutralizer and acceptor; a component in sintering of iron ores; a component in the formulation of concrete and cement products; and a neutralizer in sewage disposal.



Airco's 20 mil. lb./yr. polyvinyl alcohol plant at Calvert City, Ky.

COLTON Airco Vinol

Airco VINOL polyvinyl alcohols offer a wide range of properties. Each grade is tailored for specific applications in such varied fields as adhesives, textiles, paper, plastics, ceramics, and cosmetics. Two super hydrolyzed grades—VINOL 125 and VINOL 165—are exclusive with Airco. Super hydrolysis contributes to the increased water resistance, strength, and abrasion resistance of VINOL films. Differences in degree of hydrolysis and polymerization govern the performance characteristics of each grade. All grades dissolve easily in water, form colorless solutions, and have high adhesive strength and binding power. All produce films with high abrasion and tear resistance, resistance to grease and organic solvents, impermeability to oxygen and other gases, and high tensile strength. Some grades produce films with exceptional water resistance, while other grades produce water-soluble films. Other special properties available in some grades include increased strength, flexibility, and adhesion to porous or non-porous surfaces.

Airco VINOL is produced by a continuous process at Calvert City, Kentucky, and by batch process at Cleveland, Ohio.

		SUPER HYDROLYZED		FULLY HYDROLYZED*					PARTIALLY ACETYLATED			
	GRADE	VINOL 125	VINOL 165	VINOL 260	VINOL 230	VINOL 205	VINOL 350	VINOL 325	VINOL PA-5	VINOL PA-20	VINOL PA-40	VINOL PA-100
	PER CENT HYDROLYSIS	99.7+	99.7+	99+	99+	99+	98+	98+	86-89	86-89	86-89	86-89
	VISCOSITY	MEDIUM	HIGH	HIGH	MEDIUM	LOW	HIGH	MEDIUM	LOW	MEDIUM	HIGH	HIGH
TEXTILES	Sizing	●	●	●	●		●		●	●	●	●
	Finishing	●	●	●	●				●	●	●	●
	Binder for non-wovens	●	●	●	●	●	●	●				
PAPER & BOXBOARD	Surface sizing	●	●	●	●				●	●	●	●
	Coating	●	●	●	●		●	●				
ADHESIVES	Difficult-to-bond surfaces	●	●	●	●		●	●	●	●	●	●
	Remoistenable adhesives								●	●	●	●
	Wet-strength adhesives	●	●	●	●	●	●	●				
	Colloidal thickener	●	●	●	●		●	●	●	●	●	●
PLASTICS	Molded products	●	●	●	●							
	Water soluble films								●	●	●	●
	Grease & solvent resistant films	●	●	●	●							
	Sponges	●	●	●	●							
SPECIALTIES	Emulsions						●	●	●	●	●	●
	Ceramic binder				●	●						

*Also available in grades FH-100, FH-400, FH-500, FH-600 & FH-1500, batch process.

Vinyl Monomers *and Dialkyl Ester Comonomers*

Vinyl acetate monomer of consistently high purity with consistent polymerization characteristics is always available from Airco's two modern plants which have a combined capacity of 90 million pounds a year. Airco guarantees immediate shipment of tank car, tank wagon, and drum quantities from Calvert City or from four convenient bulk storage depots—Berkeley, California; City of Industry, Los Angeles County, California; Cleveland, Ohio; Elkton, Maryland.

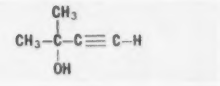
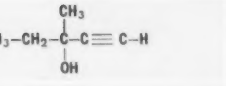
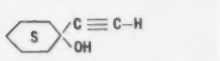
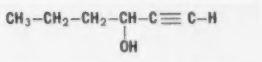
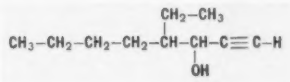
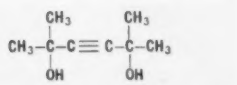
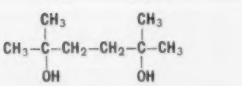
"Aircoflex" high-purity plasticizers are produced in a new, modern plant at Elkton. "Aircoflex" plasticizers are effective tools for building such properties as flexibility, shock resistance, and water resistance into copolymer resins.

"Aircoflex" is available in compartmented tank car and tank wagon shipments and in drum quantities.

monomers and comonomers	boiling point °C	refractive index	specific gravity	applications
VINYL ACETATE	72.5 (760 mm)	1.3956 (n_D^{20})	0.9342 (20/20)	Emulsion and bead polymers used widely in adhesives, paints, textile finishes, and other coatings. Intermediate for polyvinyl alcohol and polyvinyl butyral.
AIRCOFLEX DBM (dibutyl maleate)	281 (760 mm)	1.4435 (n_D^{25})	0.9930 (25/25)	Comonomer with vinyl acetate, used extensively in emulsion paint vehicles as an internal plasticizer. AIRCOFLEX content directly affects elongation, flexibility, and softness of copolymer films. May also be copolymerized with vinyl chloride, acrylates, and styrene.

Acetylenic Alcohols, Glycols, and Derivatives

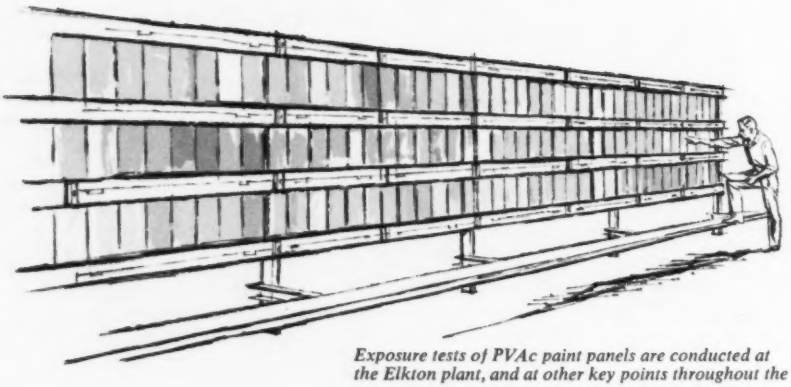
Available in commercial quantities, these specialty chemicals are produced by continuous process at Calvert City, and at Bound Brook. They are useful starting points for chemical syntheses.

products	structural formula	boiling point °C, 760 mm	melting point °C	solubility in H_2O wt. % at 20°C	applications
METHYL BUTYNOL		103.6	2.6	miscible	Stabilizers in chlorinated solvents. Viscosity reducers and stabilizers. Electroplating brighteners. Intermediate in synthesis of hypnotics and isoprenoid chemicals such as Vitamin A, ionone and perfume alcohols. Solvents for alcohol-soluble nylon and polyamide resins.
METHYL PENTYNOL		121.4	−30.6	9.9	
ETHYNYL CYCLOHEXANOL		180	30-31	1.2	Corrosion inhibitor for mineral acids. Stabilizer in chlorinated organics. Synthesis of hypnotics, other pharmaceuticals and perfumery materials.
HEXYNOL		142	−80	3.8	Corrosion inhibitor for mineral acids; high temperature oil well acidizing inhibitor.
ETHYL OCTYNOL		197.2	−45	<0.1	Acid inhibitor for mild steel, acid pickling and cleaning baths, electrolytic cleaning baths, electrolytic refining of metals, acidizing of oil wells.
DIMETHYL HEXYNEDIOL		205-6	94-95	27.0	Component in wire drawing lubricant formulations. Coupling agent in resin coatings. Organic synthesis.
DIMETHYL HEXANEDIOL		214-15	87.5-89	14.3	Synthesis of peroxide catalysts and cross-linkers, cyclic musk compounds and allethrin.

Alkyl Acetylenes

Available in drum quantities from Bound Brook, New Jersey.

products	boiling point °C, 760 mm	melting point °C	specific gravity	applications
METHYL ACETYLENE (Propyne)	−23.1	−101.5	0.660 (−13/4°C)	Synthesis of pharmaceuticals and aromatics; special fuel additives.
ETHYL ACETYLENE (1-Butyne)	8.3	−122.5	0.669 (0/0°C)	



Exposure tests of PVAc paint panels are conducted at the Elkton plant, and at other key points throughout the U.S.

Technical service

Airco's technical service laboratories, at Bound Brook, New Jersey, and Cleveland, Ohio, are equipped to assist customers on a wide range of applications problems. A technical service staff, composed of specialists on applications for specific industries, is available to discuss production processes and formulations with customers, and to set up laboratory studies related to customer problems. Special facilities for the study of resins for the paper industry are part of the Bound Brook Development Laboratory. Also at Bound Brook are facilities for the study of organic chemicals, polyvinyl alcohol adhesives, and tailored polymers. Studies on paint vehicles and formulations are conducted at the Cleveland Development Laboratory. Studies on adhesives also are conducted at the Cleveland Development Laboratory.

Sales offices

Berkeley, California—1231 Second Street, Berkeley—LAndscape 6-3365
Charlotte, North Carolina—2300 South Boulevard, Charlotte (1)—EDison 3-1157
Chicago, Illinois—3100 South Homan Avenue, Chicago (23)—BIshop 7-6100
Cleveland, Ohio—1747 Chester Avenue, Cleveland (14)—MAin 1-3060
Houston, Texas—3603 Cherry Street, Houston (26)—CApital 8-9353
Los Angeles, California—17800 East Valley Road, City of Industry—YOrktown 4-3451
New York, New York—150 East 42nd Street, New York (17)—MUrray Hill 2-6700
New Jersey—Clermont Terrace, Union—ELizabeth 4-1212
Tampa, Florida—6805 14th Avenue, Tampa (5)—TAmpa 4-6155

Chemical plants

Bound Brook, New Jersey—Calvert City, Kentucky—City of Industry, California—Cleveland, Ohio—Elkton, Maryland.

Calcium Carbide plants

Calvert City, Kentucky—Ivanhoe, Virginia—Keokuk, Iowa—Louisville, Kentucky.

AIRCO® ORGANIC CHEMICALS

COLTON® RESINS POLYMERS

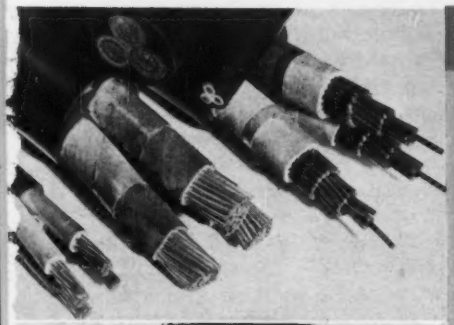
AIR REDUCTION CHEMICAL & CARBIDE CO.

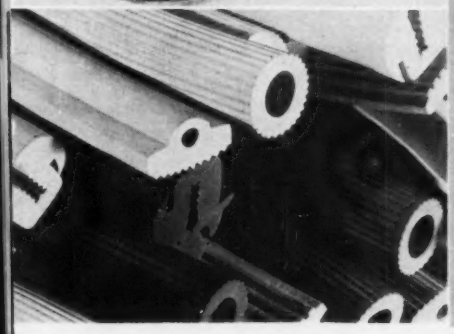
A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED

150 EAST 42nd STREET • NEW YORK 17, NEW YORK

ACC-X4-561 190M

PRINTED IN U.S.A.





Copolymer Partners Promise New Uses for Ethylene

Comonomer	*Copolymer Composition*	*Applications*	*Status*
Butene-1	Under 5% butene	High-density polymer with improved stress-crack resistance	Phillips and licensees—commercial
Propylene	15-85% propylene (usually 30-40%)	Tires; general-purpose synthetic rubber with high ozone resistance	Montecatini—nearly commercial Phillips—pilot work U.S. Rubber—building semiworks plant Hercules and Hoechst—joint development project Du Pont—sulfur-curable version being tested Esso Research—research on chlorinated version Monsanto—research on blend with polypropylene (Most petroleum and rubber companies—active in R&D)
Vinyl acetate	Undisclosed proportion	Wax additive and wax-extended polymer; adhesive base; industrial rubber	Du Pont—commercial plant being built Erdoelchemie (subsidiary of Bayer and British Petroleum) — planning semicommercial production
Ethyl acrylate	Minor proportion of acrylate	Flexible thermoplastic, similar to vinyls	Dow — recently commercial Union Carbide—patents; unidentified ethylene copolymer recently commercial

Ethylene Readies for a New Role

Ethylene, long a premier soloist on the commercial polymer stage, is in the spotlight anew, this time as part of copolymer duets. A number of developments in the past two months has focused new attention on three new ethylene copolymers in particular: a sulfur-curable ethylene-propylene rubber developed by Du Pont (previously, EPR was thought to require peroxide curing) and copolymers of ethylene with vinyl acetate and with ethyl acrylate (*table, above*).

Ethylene's delayed debut in copolymers points up the main difficulty of working with two different monomers: one generally polymerizes faster than the other, leading to a nonhomogeneous product. Ethylene, for instance, polymerizes slower than substituted equivalents, such as vinyl compounds. But the commercial appearance of the new products is evidence of major advances toward controlling monomer reaction rates.

The new products promise synthetic rubber that may win major automobile tire and other large-volume markets; flexible thermoplastics that will compete with vinyls; and various industrial and specialty polymers.

Olefin Partners: Ethylene's copolymer role isn't entirely new; it has been linked with another olefin—butene-1—in copolymers for several years. The butene content in these, however, is small (under 5%), and the addition is made essentially to "tailor" the polyethylene (*CW, Feb. 27, '60, p. 75*). In this case, as utilized by Phillips Chemical Co. and its licensees, butene improves the stress-crack resistance of high-density polyethylene. The butene introduces a small, controlled amount of branching to an otherwise linear polymer chain.

This branching is also the aim of the high percentage of propylene in a newer copolymer. When propylene is added in large proportion, it gives amorphous, rubbery products. (This occurs even though the general process is similar to that used in making rigid plastics of polypropylene and high-density polyethylene). Phillips has piloted ethylene-propylene copolymers on "substantial scale" and says it has an overseas licensee that is producing them commercially.

U.S. Rubber Co. has piloted EPR and several other stereospecific elastomers at Naugatuck for five years, will have a semiworks plant in operation at Baton Rouge by the end of the

year. Products will include cis-polybutadiene and cis- and trans-polyisoprene as well as EPR.

Abroad, Montecatini has been developing ethylene-propylene rubber for some time, is currently supplying its Dutral rubber from a pilot plant at Ferrara, Italy. A 20,000-metric-tons/year plant is due onstream at Brindisi by '62. Three applications for this material are pictured on p. 51.

Montecatini has tried several curing systems but is now concentrating on peroxide in the presence of small amounts (up to 0.2%) of sulfur, which increase the crosslinking efficiency of the peroxide. However, carbon black and antioxidants tend to retard the vulcanization rate, require extra peroxide.

Montecatini has studied other methods of providing EPR with crosslinking sites: chlorosulfonation (2-3% chlorine); chlorination (5-15% chlorine); introduction of a few double bonds (by copolymerization with a diene or by dehydrogenation of the EPR); grafting reactive groups on the chain; and crosslinking with monomers that react by free-radical mechanism. The company believes that other inconveniences in processing EPR—e.g., lack of tackiness—can be overcome.

A joint U.S.-European research effort on EPR is being carried out by Hercules Powder Co. and Farbwerke Hoechst. The two firms, which jointly own Abieta Chemie GmbH. at Gersthofen (near Augsburg, Germany), are working with compositions of approximately two parts of ethylene to one of proplyene, with a peroxide curing agent. Good general-purpose rubber is reported by Hercules (which is test-marketing samples), but research is still needed on such problems as the tackiness one.

Hoechst describes the work as 'progressing," but still not advanced enough to be stepped up, even to semicommercial scale. In addition to tire use, Hoechst sees fibers of EPR as a possibility (presumably a different, less rubbery composition).

Sulfur Cure: Du Pont's work on EPR has centered on making a sulfur-curable product. Though not necessarily cheaper than a peroxide cure, sulfur vulcanization is more familiar, can be carried out in existing rubber-making facilities with conventional recipes. Du Pont says the work is in the laboratory stage, but indicates that rubber with good resistance to ozone, weather and abrasion has been produced. Field evaluation of products is now being started and, if these tests prove out, the rubber will be piloted at Beaumont, Tex. Successful piloting would bring the material to the commercial stage in about two years, says Du Pont.

Because of its broad applicability and potentially low cost, EPR has attracted the attention of most firms with a source of the needed monomers or markets for finished rubber.

Esso Research & Engineering, for instance, has an Australian patent application (55,425) on a chlorinated copolymer of ethylene and another α-olefin (such as propylene). Monsanto Chemical Co. has Australian patent application 62,004, which describes a blend of 5-50 parts of ethylene-propylene copolymer with 50-95 parts of polypropylene. And Standard Oil Co. of Indiana holds Belgian patent 594,378, which describes a method of producing homogeneous copolymers of ethylene and α-olefins (a process that the firm says it is piloting).

Vinyl Version: Copolymers of ethylene and vinyl acetate are about to go into sizable production both in the U.S. and in Europe. Du Pont recently disclosed that it is building a commercial unit at Orange, Tex., for Elvax, a copolymer aimed at use as a wax additive, wax-extended polymer or adhesive base (*CW Technology Newsletter, May 6*).

In Europe, work on elastomers made from ethylene and vinyl acetate is being carried out by Erdoelchemie, GmbH., which is jointly owned by Farbenfabriken Bayer and British Petroleum. A "semicommercial" plant (usually a small commercial plant by U.S. standards) will be built by Erdoelchemie at its large petrochemical complex at Dormagen. Bayer says the material is easily vulcanized and cheaper than competitive materials—but it's slated for use as industrial rather than tire rubber.

At last year's German Rubber Conference in Berlin, Bayer researchers reported that copolymers having a vinyl acetate content of 30-50% give rubbery products, while those with lower vinyl content behave more like plastics at room temperature and elas-

TO BRING CAUSTIC CLEANING UP-TO-DATE

ADD PFIZER GLUCONATES TO YOUR CAUSTIC FORMULATIONS FOR: BOTTLE WASHING • RUST REMOVAL • ALUMINUM ETCHING • STRIPPING PAINT FROM STEEL

Give your customers more efficient caustic cleaning compounds by adding Pfizer Gluconates to your formulations.

Bottles will wash up sparkling clean, free of haze and rust spots. More efficient aluminum label removal will be possible. Scale will not develop on bottle washing equipment.

Pfizer Gluconates make possible outstanding rust removal compounds that not only dissolve rust but help retard after-rust. Also, when added to standard alkaline cleaning compounds a small amount of gluconate helps remove light rust films.

In aluminum etching compounds Pfizer Gluconates prevent hard, adherent scale from forming—efficiently and economically. You use very little gluconate yet are sure of an even, uniform etch.

And Pfizer Gluconates improve efficiency in caustic paint-stripping compounds—by increasing the rate of paint film removal and permitting free rinsing of paint-stripped metal. The usual after-film of iron oxide is eliminated.

Now Available—new Pfizer Sodium Gluconate Granular. This new mesh size lends itself to mechanical blending with granular caustic to produce uniform dry caustic-gluconate combinations.

Make sure your line of caustic cleaning formulations is up-to-date by using Pfizer Gluconates. For further information write:

Chas. Pfizer & Co., Inc., Chemical Division, Brooklyn 6, New York.

Please send me Technical Bulletin 102, *"Pfizer Products for Chemical Cleaning"*

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

CW

Science for the world's well-being®

Pfizer CHEMICAL DIVISION

tomers at higher temperatures. In British patent 859,743 Bayer describes copolymers of ethylene and vinyl esters using free-radical-type catalysts and comprising 2-15 parts of ethylene to each part of vinyl ester.

Other Hopefuls: Two other ethylene copolymers that have recently come on the market are Dow Chemical's ethyl acrylate material (Zetafin) and Union Carbide Plastics' unidentified copolymer (Bakelite DPDB-6169). Both are flexible thermoplastics with properties similar to vinyls (*CW Technology Newsletter, April 15*). Carbide holds two U.S. patents (2,953,541 and 2,953,551) on copolymers of ethylene and acrylates.

An example of the type of copolymer that is possible and that has actually been studied is described in Du Pont's British patent 857,099. This is a rigid and tough ethylene copolymer that involves a tricyclic olefin made by Diels-Alder condensation of a cyclic monoolefin with cyclopentadiene. The product made from cyclohexene, for instance, would be 2,3-dehydrodecalin with a 1,4-methylene bridge across the ring containing the double bond.

A great many more ethylene copolymers are undoubtedly being worked on in labs throughout the world; and recent developments indicate that some of these may soon be making their commercial debut.

Analysis Step-Up

Highlights of recent work in chemical analysis: a new method for separating four hard-to-analyze metals, delivery of an English spark-source mass spectrometer in the U.S., and first reports on an international chemical conference in Hungary.

In this country, the National Bureau of Standards has developed a procedure for separating the troublesome mixture of titanium, zirconium, iron and aluminum and determining the amount of each metal present within 0.2 mg. Here are the five main steps, starting with mixed oxides: (1) precipitate all four metals with 8-hydroxyquinoline to separate them from alkalies, alkali earths and other metals; (2) dissolve the precipitates in a mixture of citric and hydrochloric acid solutions and precipitate iron with 1-nitroso-2-naphthol; (3) precipitate titanium and zirconium with cupferron

Miles has a prompt way with

CITRIC ACID (U.S.P.)

...as much or as little as you want, as soon as you need it!

Dependability makes Miles a valuable source of citric acid, both hydrous and anhydrous. Small quantities or large, you can count on fast delivery of a product that is made to exacting U.S.P. standards.

For years, Miles has been producing citric by a unique deep-fermentation process in quantities that assure you of a steady supply. Now, with 70 warehouses strategically located and abundantly stocked, Miles service is virtually at your elbow.

Dependable delivery, plus years of experience, are the extra dimensions Miles adds to the versatile talents of citric acid. Put these extra dimensions to work for you. Check with Miles today, by phone, or write for more information.

MILES Chemical Company
Division of Miles Laboratories, Inc.
Elkhart, Indiana – COngress 4-3111

C-2-1

(the remaining aluminum can be precipitated with cupferron at pH 4); (4) decompose the titanium and zirconium products and redissolve them in sulfuric acid; and (5) complex the zirconium and ethylenediaminetetraacetic acid and precipitate the titanium with 8-hydroxyquinoline at pH 4.5 (finally precipitating the zirconium with cupferron).

The new mass spectrometer, a four-ton machine that can detect solids in parts-per-billion concentrations within an hour, was delivered to Radio Corp. of America's Research Center at Princeton, N.J., by Associated Electrical Industries (Manchester), Ltd. (Manchester, England). Consolidated Electrodynamics Corp. (Pasadena, Calif.) offers a similar unit (*CW, March 4, p. 69*).

The conference, cosponsored by the International Union of Pure and Applied Chemistry and the Hungarian Chemical Society, was held at Budapest in April; only recently have comments on the meeting become available. Of close to 400 papers given, nearly half were Hungarian, only 9 were Russian, and 25 came from Western countries, including two from the U.S. Among the wide variety of subjects reported: an automatic radiometric titration system (Czech); methods for detecting parts per billion of copper and antimony in germanium and graphite (East German); new techniques for determining length of alkyl chains in polyalkyl methacrylates (Hungarian); and a direct-current conductrimetric method using nonpolarizable external electrodes (Rumanian).

EXPANSION

• Bureau of Mines is dedicating its new $2.5-million research center between Minneapolis and St. Paul, Minn. The facility will be devoted to metallurgical and mining research and to mineral resource studies.

• National Lead Co. has started construction of a "multimillion-dollar" research center in East Windsor Township, N.J. Separate units will be built on the 250-acre site for each of the company's divisions. The first unit, an 87,000-sq.ft. building, will be completed by the summer of '62. A staff of 150 will be transferred to the new center from the firm's Brooklyn Research Laboratories.

• Hazleton-Nuclear Science Corp.

METADELPHENE® to help military protect personnel from mosquitoes and other biting pests...

A recent U.S. military bid for an all-purpose insect repellent is being filled with Metadelphene (Hercules diethyltoluamide, or deet*). Deet is now specified by the military as the new standard all-purpose insect repellent, replacing the older triple mix material.

Deet, a complete repellent in itself, offers greater protection from a wider range of biting pests than the formerly used combination of three repellent compounds. In addition, deet provides the military superior resistance to wiping action and sweating as well as an amazing ability to withstand the effect of water rinsing that servicemen might encounter during exposure to heavy rainfall and while fording streams.

This same material, selected by the military to protect servicemen under the most extreme field conditions, is available for your commercial preparations. In addition to its proved effectiveness, Metadelphene does not leave a greasy film on the skin. No other insect repellent need be added to Metadelphene—no other chemical or combination of chemicals can approach its performance. Metadelphene *in itself* is the *complete insect repellent!*

*"deet" is the common name officially adopted by the Entomological Society of America for the meta isomer of diethyltoluamide

METADELPHENE

...a product of Agricultural Chemicals Division

HERCULES POWDER COMPANY
INCORPORATED

Hercules Tower, 910 Market St., Wilmington 99, Del.

ND61-1

(Palo Alto, Calif.) is stepping up its program of offering nuclear R&D capabilities to industry and government, has named Paul Kruger manager of the Nuclear Projects Dept.

• Atlantic Research Corp. plans a summer dedication of its combined laboratory, plant and headquarters buildings at Alexandria, Va. They will cover 250,000 sq.ft. when completed.

• Esso Research & Engineering Co. has completed over $250,000-worth of new facilities for testing of solid propellants, under a $4.9-million contract from the Advanced Research Projects Agency.

• General Electric Co. will build a $100,000 facility at its Atomic Power Equipment Co. site (San Jose, Calif.) for large-scale testing of internal steam separation systems used in nuclear reactors.

• Armour Industrial Chemical Co. has opened a new 30,000-sq.ft. laboratory and pilot plant at McCook, Ill., devoted to research in chemicals made from fats and oils.

PRODUCTS

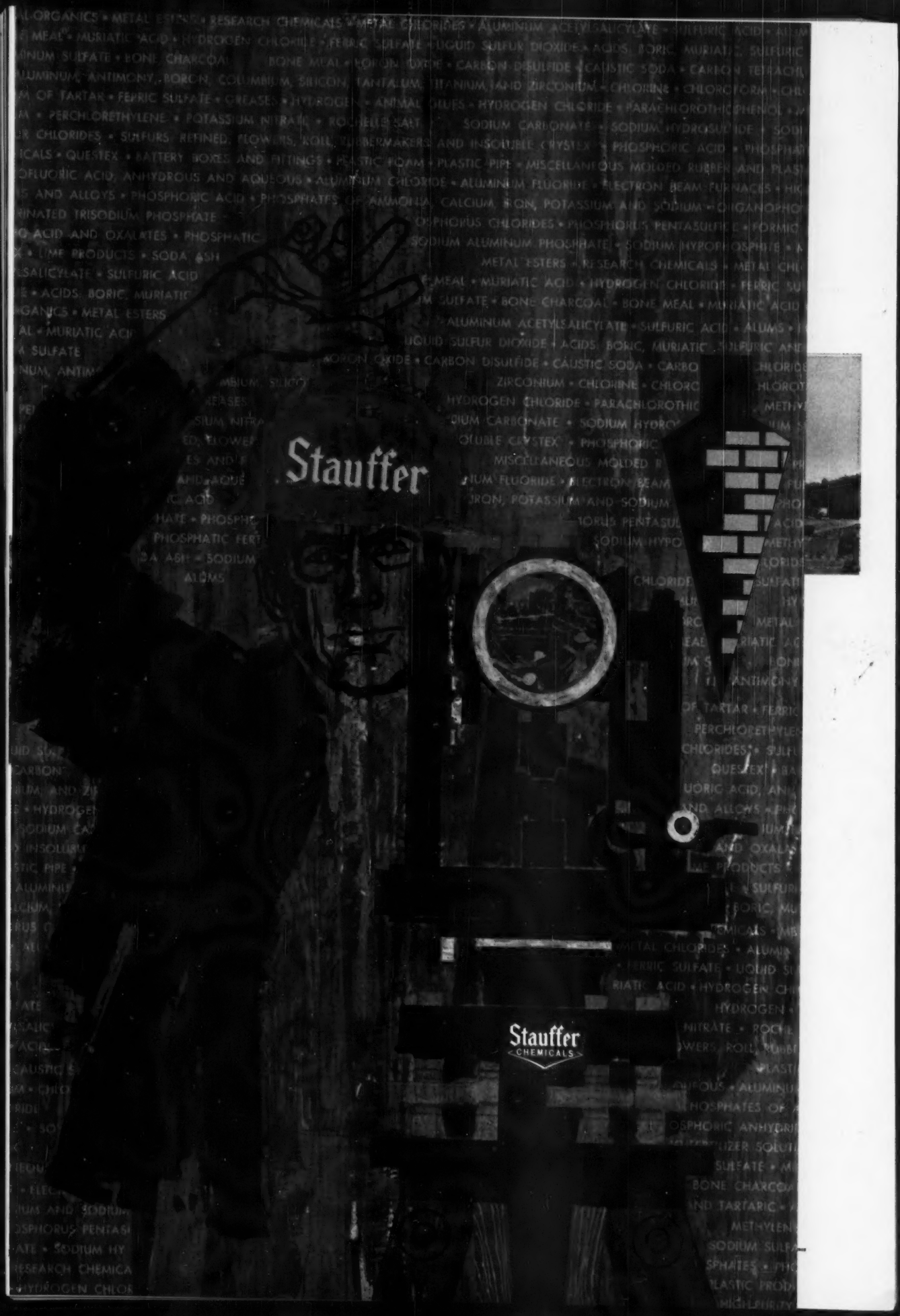
Nitrile Silicones: General Electric Co.'s Silicone Products Dept. (Waterford, N.Y.) has developed a new class of nitrile-containing silicone fluids. The new fluids, still termed experimental, are resistant to organic solvents, have limited electrical conductivity and a high dielectric constant. Proposed uses are in nonaqueous antifoams, base stocks for solvent-resistant greases and coatings, and antistatic agents.

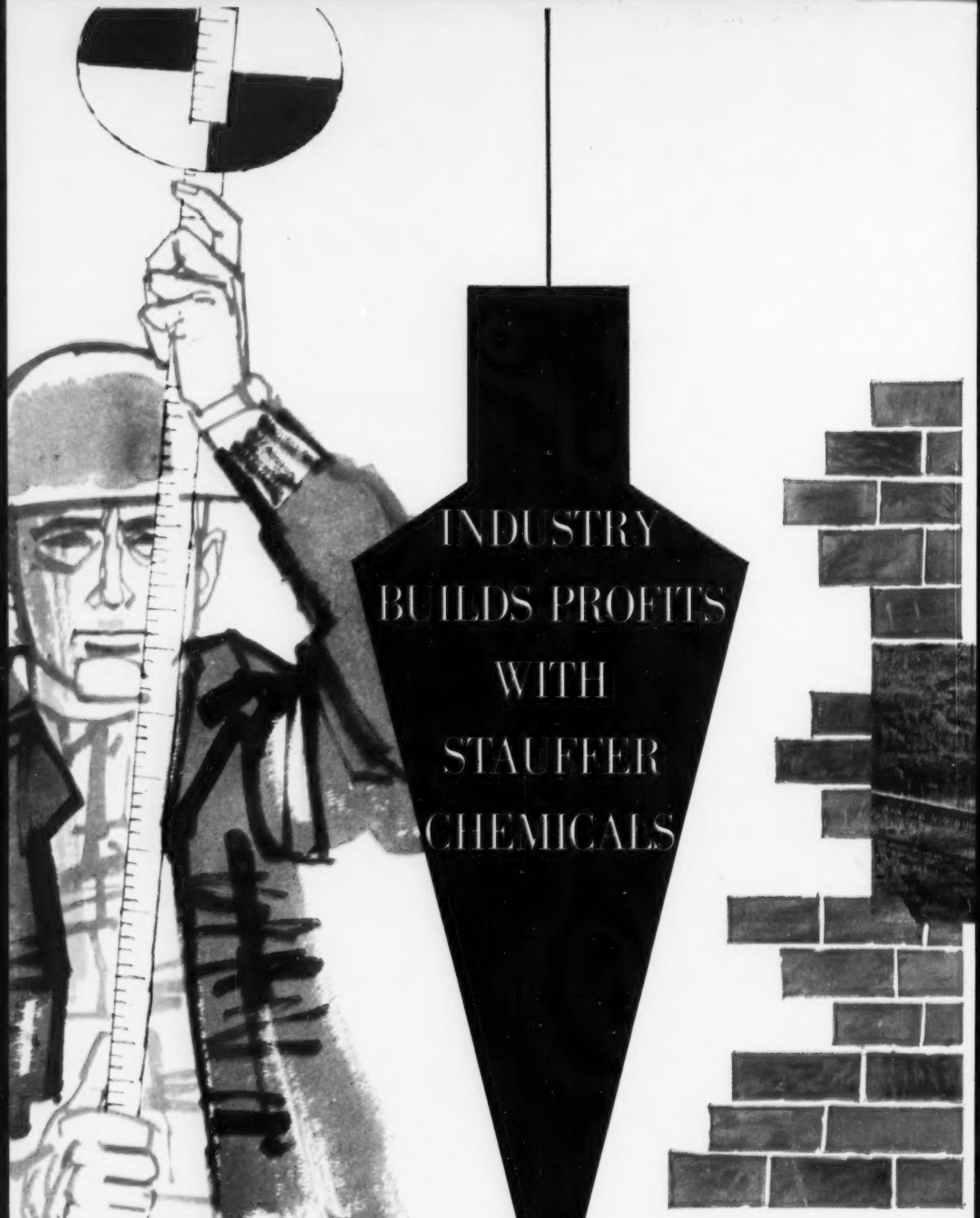
•

Large Zinc Crystals: Semi-Elements, Inc. (Saxonburg, Pa.), is now offering single crystals of zinc that weigh over 30 lbs. and are 99.999+% pure. Price is $100/lb. for "as is" ingots 5 in. in diameter and 5 in. long. Processed crystals are also available, at higher prices. The firm is working on techniques to make zinc crystals as large as 400 lb., and large copper crystals are also under development.

•

Peroxy Catalysts: Two new peroxy catalysts for polymerization studies are now available in pilot-plant quantities from U. S. Peroxygen Corp. (850 Morton Rd., Richmond, Calif.): 2,5-dimethylhexyl-2,5-diperbenzoate and the corresponding diperacetate.


Stauffer
Stauffer
CHEMICALS



Stauffer
CHEMICALS

Stauffer Chemical Company
380 Madison Avenue, New York 17, N. Y.
Please send me literature checked (titles and numbers at right): 1 2 3 4 5 6 7 8 9 10
What can you suggest to help us solve a problem in

.....
(Product or Process)

Name.....

Company.....

Street.....

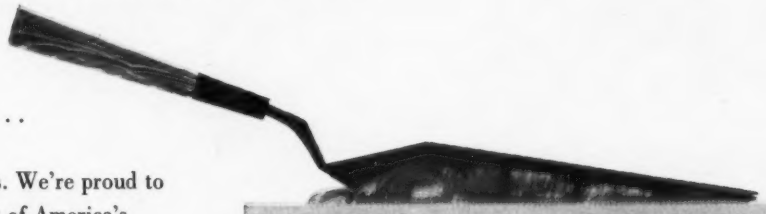
City.....Zone....State.....

1 Caustic Soda

2 West E Chemic

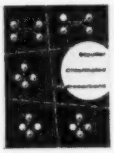
AGRICULTURAL CHEMICALS DI
MOLDED PRODUCTS DIVISION

Metals and concrete, muscles and *chemicals!* These are the heart of the great Niagara power project! Chemicals—scores of them made by Stauffer—are unseen building blocks. Chemicals for cement . . . acids to finish steel . . . catalysts to produce power that drives trucks that move raw materials. Chemicals for plants that *use* power . . . paper mills, textile mills, food processors, water works . . . these and many others *specify* Stauffer chemicals. We're proud to share so broadly in many of America's great construction projects. Do chemicals play a part in your business? Stauffer has many constructive chemical ideas which may build profits for you. Tell us your problem . . . or take a minute and fill out the coupon. It's an easy way to find a profit-builder for your business.



3 Hydrofluoric Acid

4 Chlorinated Hydrocarbons



5 Muriatic Acid

6 Metal Chlorides

7 Stauffer Sulfurs

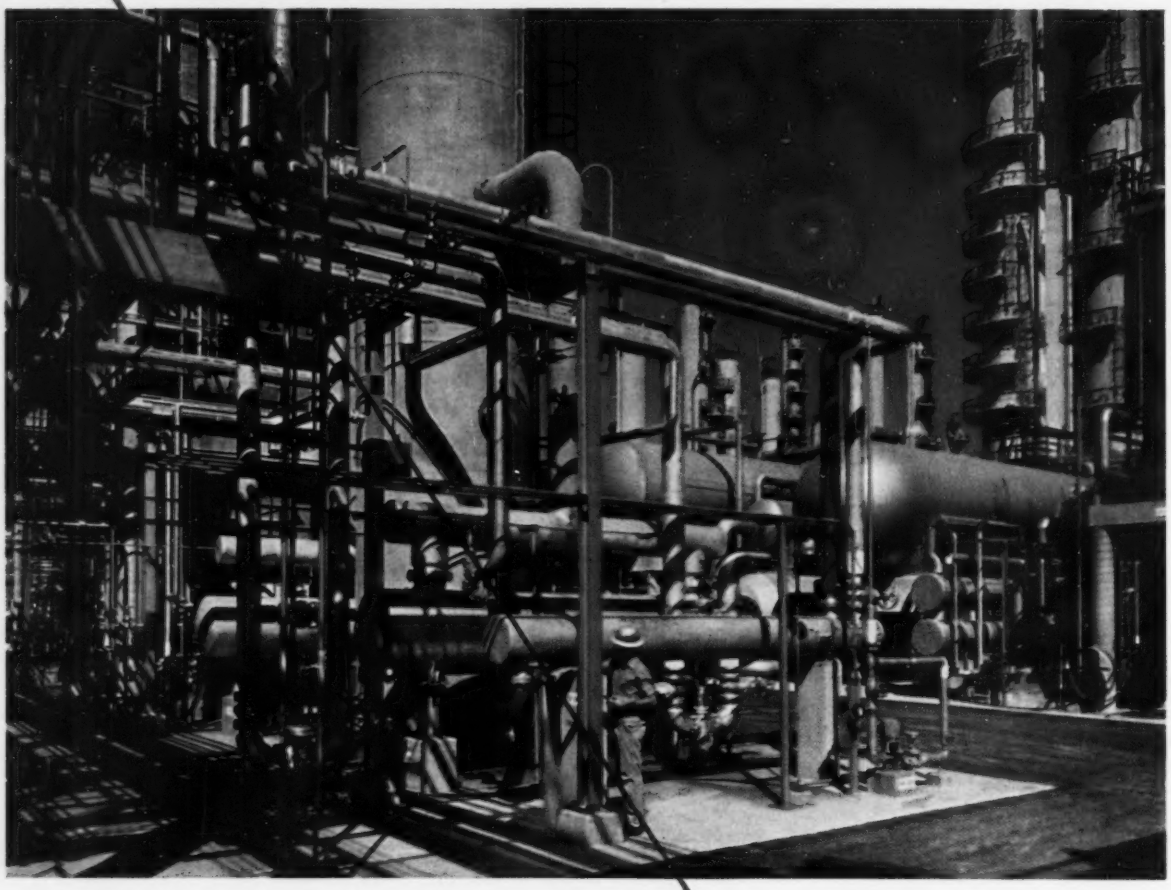
8 Victor Chemicals

9 Aluminum Sulfate

10 Molded Products

• ANDERSON CHEMICAL DIVISION • A. R. MAAS CHEMICAL DIVISION • CONSOLIDATED CHEMICAL INDUSTRIES DIVISION • INDUSTRIAL CHEMICALS DIVISION
EX CHEMICALS DIVISION • METALS DIVISION • VICTOR CHEMICAL WORKS DIVISION • WEST END CHEMICAL COMPANY DIVISION • INTERNATIONAL DIVISION

Important Quality Improvements in *Petro-Tex n-BUTENE-1*



Deliberate removal of undesirable olefins from our commercial production of Petro-Tex n-Butene-1 has resulted in a very substantial quality improvement over the past two years.

Petro-Tex n-Butene-1 is now being used by important linear olefin polymer producers. As a highly reactive alphaolefin, it undergoes a wide range of oxidation, hydration, alkylation and oxo-process reactions which commend further study of its use for n-butyl alcohol, butylene oxides as well as various copolymers and petro-chemicals.

We invite inquiries on Petro-Tex n-Butene-1 and

n-BUTENE-2 ISOBUTYLENE
BUTADIENE DIISOBUTYLENE TRIISOBUTYLENE
TETRAHYDROPHTHALIC ANHYDRIDE

PETRO-TEX CHEMICAL CORPORATION

8600 PARK PLACE BOULEVARD, HOUSTON 17, TEXAS

JOINTLY OWNED BY
FOOD MACHINERY AND CHEMICAL CORPORATION
TENNESSEE GAS TRANSMISSION COMPANY

Metal Hydrides' Davis (left), Callery Chemical's Sanner: American producers prefer the liquid phase.

Eyeing a Breakthrough in Borohydride?

A new process is dropping the price of sodium borohydride, raising hopes for new markets.

A brand-new sodium borohydride process has been put into commercial operation at Farbenfabriken Bayer AG. (Leverkusen, West Germany). The new process reportedly permits the Germans to turn out product for appreciably less than the current U.S. price. And since marketing efforts will extend to the U.S., this development could help sodium borohydride rise from its current specialty chemical status—sales in the $500,000/year range—into a bulk product.

Bayer is backing its challenge to America's dominant position in borohydride with an 80,000-lbs./year plant (U.S. output potential is near 5 million lbs./year). However, the world market for the chemical is only 25,000 lbs. this year. Consequently, a substantial new use must be found before this capacity becomes anything more than academic. Incentive for finding such a use will be heightened by price cuts.

Bayer says that sodium borohydride's high cost has steered research and development men away from it in the past, despite its intriguing, versatile properties. The chemical is water-soluble and reduces all kinds of organic compounds.

Commercial applications in pharmaceuticals, the paper and pulp industry and dye and plastic manufacturing seemed out of the question, economically. (The U.S. capacity was built in anticipation of a military fuels market that never materialized.)

Process Trick: The new process is the outgrowth of a tack that is essentially different from the American scheme. Bayer uses a solid-phase reaction; the two American producers —Metal Hydrides, Inc. (Beverly, Mass.) and Callery Chemical Co. (Evans City, Pa.)—use basically similar liquid-phase reactions, says E. G. Sanner of Callery.

Bayer reacts sodium tetraborate (borax), silicon dioxide (quartz) and sodium under hydrogen pressure of 3 atm. The U.S. processes are based on a reaction involving sodium hydride and trimethylester boric acid in a boiling solvent at about 260 C.

Early Try: Originally, Bayer sought a commercial borohydride process involving a reaction between calcium hydride, sodium metaborate and sodium under hydrogen pressure of about 60 atm. at 450-600 C. The feed materials for this, however, required extensive preparatory processing: to insure high reactivity, they had to be finely milled and intimately mixed; to prevent high losses through dusting, they had to be briquetted.

To get around these problems, Bayer worked up a process based on the reaction of sodium and borax at 450-500 C, but only under 3-atm. hydrogen pressure. This second route, however, resulted in low yields.

Final Route: Bayer's current process is claimed to merge the attractions of the two routes while eliminating their disadvantages. Capital investment has been reduced by eliminating high-pressure vessels and the milling, mixing and briquetting equipment for raw materials.

Here's how it works. Anhydrous sodium tetraborate and silicon dioxide are fed to a rotating smelting furnace. There, sodium borosilicate is made. This goes from the furnace to open chilling pans, where it solidifies, then passes through roller mills and into a storage hopper.

The borosilicate and sodium, under

a blanket of hydrogen at 3 atm., are fed to a reaction vessel. The sodium is kept molten by a vessel temperature of 450-500 C. The mix is dumped into an agitated-tank extractor into which is fed liquid ammonia. The ammonia dissolves the sodium borohydride produced by the reaction, and the sodium silicate that is formed exits from the bottom of the extractor.

The ammonia-borohydride solution is fed to a dryer, where ammonia is driven off as vapor, condensed and recycled to the extractor. The sodium borohydride crystals are further dried, made ready for packaging.

Eye on Markets: Bayer, of course, is well aware of sodium borohydride's potential as a production intermediate for high-energy boron compounds. Once these looked promising as powerful jet-engine fuels, others as rocket fuels. But Bayer is counting on this application as only a minor market, since boron-type propellants have seemingly moved out of the spotlight. A sharp price cut, however, could reawaken boron-fuel programs.

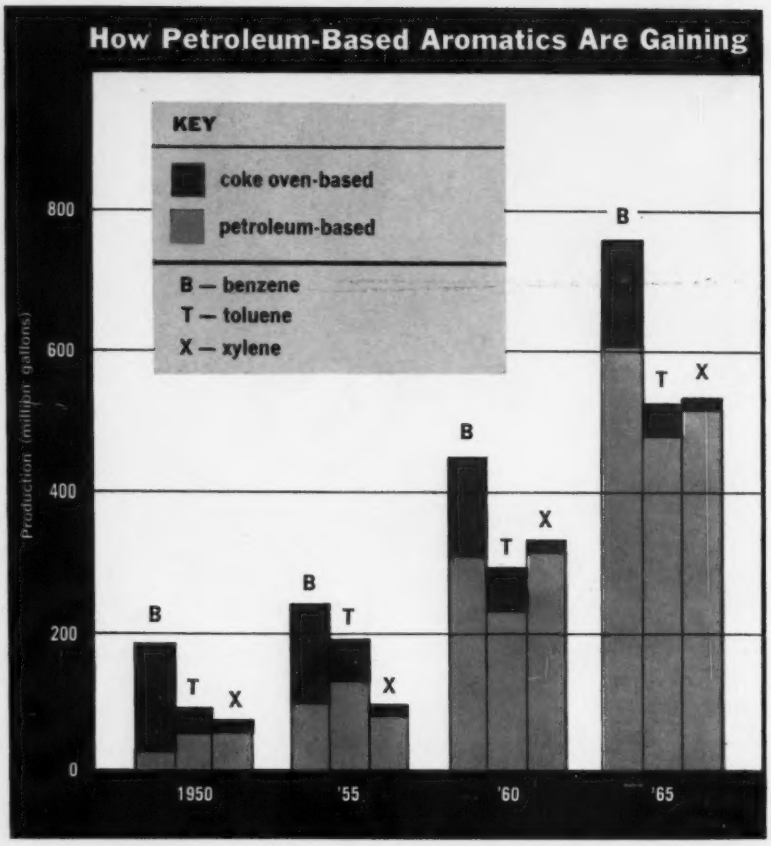
Sodium borohydride can be used to generate high-purity hydrogen via reaction with water over a catalyst. Thus it might be used to foam rubber and various plastics. Also, Bayer foresees use of its product in the manufacture of boron hydrides, amino and alkyl boranes, and hydrazine boranes.

Worldwide: In the U.S. today, there is excess borohydride capacity. Metal Hydrides has about 2-million-lbs./-year capacity. And it has just purchased equipment at Danvers, Mass., from the government (*CW, May 6, p. 44*) that will add another 2-million-lbs./year capacity this fall. Callery Chemical has facilities for almost 1-million-lbs./year production.

Metal Hydrides' President Lewis Davis says his company investigated processes akin to Bayer's, but rejected the solid-phase approach early in the game. Trade speculation is that Bayer may be charging off part of its new sodium borohydride project to other activities within its complex.

Present uses will expand; new ones will develop. Consequently, while sodium borohydride's future can't be pinned down, there's new reason to figure that it will be bright.

Process competition sparked by the Bayer process could result in further price reductions and consequent market expansion.



Can Cokers Strike Back?

Three new desulfurization processes to clean up coke-oven BTX (benzene, toluene and xylene) and naphthalene have just been developed by U. S. Industrial Chemical Co. (New York). The coal-chemical industry, which has watched petrochemical producers encroach on its territory (see graphs), now has what may well be a solid weapon with which to counterattack.

The first process to reduce the market-hobbling sulfur content uses a mechanically agitated system. It can take an oil with thiophene and other sulfur bodies at 1000 parts/million and yield an oil with 1 ppm fractions.

The main piece of equipment is a heated ribbon blender which contains an inert sodium carrier. Any material that is inert to sodium can be used as carrier, and USI has found that blast furnace slag, silica sand, soda ash or salt work.

The inert material in the blender is treated with metallic sodium, under nitrogen until it has acquired 2-6% sodium metal. The blender is heated by circulating hot oil through a surrounding jacket, and the benzene (or other aromatic) which has passed through a rotometer and vaporizer, is passed in.

The sulfur impurities in the aromatic combine with the elemental sodium to form sodium sulfide. This sulfide is collected and removed through the bottom of the blender, while the clean gas is taken off overhead and condensed.

Cost: USI's cost estimates for a system assuming a 10,000 gal./-day capacity (a $200,000 investment) working on an acid-washed light oil containing 1000 ppm thiophene: 100 lbs./day of sodium raw material (based on 45% sodium efficiency) will cost 0.22¢/gal.; utilities will be 0.28¢/gal.; and conversion costs (one man @ $2.75/hour, supervision and maintenance will come to 1.05¢/-gal. Direct operating cost: 1.55¢/gal.

Alternate: The second process

Want top performance in Acrylic Coatings? ...formulate with CELLOSOLVE Acetate

DEMAND for CELLOSOLVE Acetate by producers of acrylic lacquers for automotive finishes and other coatings is the strongest endorsement of its performance.

A high-boiling solvent, CELLOSOLVE Acetate contains a combination of functional groups that impart unusual properties to this ester. Because of its slow evaporation rate and good flow-out characteristics, CELLOSOLVE Acetate is valuable in the formulation of hot spray lacquers, both straight acrylic and modified acrylic, and in high-low thinners. Its mild odor is a big added advantage.

Acrylic Lacquers containing CELLOSOLVE Acetate are outstanding for their easy sprayability, good flow-out, improved blush resistance, and exceptionally high gloss. Finish hardness develops faster on force-drying for fifteen minutes at temperatures up to 200 degrees Centigrade.

For complete information on CELLOSOLVE Acetate and the other standard Acrylic solvents—such as Acetone, Methyl Ethyl Ketone, Methyl Isobutyl Ketone, and Isopropanol—call your nearest CARBIDE Technical Representative, or write: Union Carbide Chemicals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, New York.

UNION CARBIDE CHEMICALS COMPANY

UNION CARBIDE

CELLOSOLVE and UNION CARBIDE are registered trade marks.

(based on fluidized solids) will also yield a BTX product with thiophene content less than one ppm. The plan is suggested for coke oven plants with capacity for at least 10,000 gals./-day of light oil.

As in the mechanically agitated system, silica sand or blast furnace slag, 80-200 mesh, works better than other sodium carriers such as salt or soda ash. A level of 2.5-3% sodium is carried in the inert medium.

The incoming oil is vaporized and heated to 425-600 F. It's contacted with the sodium mixture for only 2-6 seconds. This is long enough for sodium sulfide to form and the relatively pure aromatic to separate.

As in the first case, the spent sodium bed can be fed to a screw conveyor and treated with steam to eliminate any last traces of active sodium.

Costs: The fluidized system costs are lower than those of the mechanically agitated scheme. The basis for estimation is 30,000 gals./day of acid-washed light oil. Investment is estimated at $350,000 and incoming oil is assumed to have 1000 ppm. impurities.

Raw material sodium need will be 400 lbs./day, will cost 0.293¢/gal., based on a 33% sodium efficiency. Utilities (steam, electricity, coke oven gas and cooling water) are estimated at 0.016¢/gal. And the conversion costs total 0.410¢/gal. of oil. Total: 0.862¢/gal.

Naphthalene: The process for taking the sulfur out of naphthalene is even cheaper than from BTX. Crude naphthalene contains many naturally occurring impurities which are said to lend themselves to reaction with metallic sodium.

The sodium is metered directly to the reaction kettle. With adequate agitation, it quickly emulsifies and reacts with the naphthalene impurities.

The process can be either batch or continuous. For a batch system, assuming 10 million lbs./year capacity and a $50,000 investment, the sodium costs 0.440¢/lb., the utilities costs 0.0062¢/lb. and the conversion costs would be 0.1222¢/lb. Total: 0.5684¢/lb.

For a 50 million lbs./year, $100,-000 continuous system, costs are 0.3600¢/lb. of sodium, 0.0020¢/lb. utilities, and 0.0671¢/lb. conversion costs. Total comes to 0.4291¢/lb.

Outlook: These three systems, USI says, will give the coke oven operator a chance to compete with BTX producers starting with petroleum. The petroleum companies got into the aromatics business because they had excess capacity in catalytic reforming. (The expected demand for high octane gasoline never materialized — the popularity of compact cars and jet aircraft, both of which do not need the higher octanes, is credited with altering the gasoline outlook). With the 1959 steel strike resulting in benzene and naphthalene shortages, petroleum refiners had still more incentive to use their reformers for aromatics.

Result: The coke oven BTX business just hasn't grown. Its high-sulfur products singly couldn't compete with the refiner's low-sulfur products. Now, however, these new processes may give coke oven operators a way to fight back.

PROCESSES

Urania-Beryllia: A new process — details of which are still secret—will soon be employed in fabricating urania-beryllia fuel elements to be used in Tory II-C, the third in a series of reactors proving out ramjet propulsion via nuclear energy. The elements will be supplied by Coors Porcelain Co. (Golden, Colo.) under a two-year, $4,290,000 contract from the Lawrence Radiation Laboratory, Livermore, Calif.

•

AEC Invitation: The U.S. Atomic Energy Commission wants users of low-temperature process heat to express their interest in a cooperative reactor demonstration project. Included in the project will be an indirect-cycle nuclear steam-supply system for saturated steam at 15-200 psi. and for a plant output capacity of 30-40,000 thermal kilowatts. Invitation details are available from Kenneth A. Dunbar, manager, U.S. Atomic Energy Commission, 9800 South Cass Avenue, Argonne, Ill. Returned details are due June 19, '61.

•

Nickel Plating: A new process for plating bright nickel deposits has been developed by Metal & Thermit Corp. (Rahway, N.J.). Lined steel tanks are used. Employing a Watts-type bath with air or mechanical agitation, the process reportedly gives high-bril-

eye

buy

If you visualize the BUYERS' GUIDE ISSUE of Chemical Week as some sort of a super mail order catalog here in the Chemical Process Industries, please discount the impression. We readily admit not all of the 48,000 management men who receive the GUIDE this Fall will buy something every time they pick it up. After all you don't turn to "Dust Collectors", check listings and ads, and make a $55,000 capital expenditure just like that. It doesn't work that way . . . even though the CPI does spend $57 billion-a-year for equipment and raw materials.

What the BUYERS' GUIDE does is just what its name says. It leads . . . shows the way . . . answers questions . . . solves problems . . . wins (or loses) arguments. With utmost convenience and comforting reality, it settles critical questions . . . *"Where can I buy fatty acids? Who makes corrosion-resistant valves? Where's their nearest field engineer?* . . . and busy CPI-Management moves a step closer to a buying decision.

This is how the BUYERS' GUIDE soothes the tired feet of your salesmen, saves the precious time it takes someone to write a letter and Uncle Sam to deliver it, and you to answer. This is why you have to make a buying decision only once a year *(for the finest BG ad you've ever run)* . . . and have it work unceasingly for purchasing action from your best customer-prospects.

Chemical Week Buyers' Guide Issue

Published . . . September 30

Closing . . . June 15, 1961

liance deposits with good brightening rates and chromium receptivity. The new bath consists of a nickel sulfate, nickel chloride, and boric acid solution with organic addition agents.

•

Steel Galvanizing: An improved process for the hot-dip galvanizing of steel has been developed by Texas Division of Dow Chemical Co. (Freeport, Tex.). Key change: the addition of 0.04-0.05% by weight magnesium to the galvanizing bath. This innovation, a six-year evaluation program shows, yields a 20-90% improvement in corrosion resistance. Linked to this development is a new zinc-magnesium alloy, designed to simplify the galvanizing process, eliminate direct addition of magnesium ingot. The alloy, 97% zinc, 3% magnesium, is sold by The Eagle-Picher Co. (Cincinnati).

•

Continuous Casting: The Babcock & Wilcox Co. (New York) has licensed to Roanoke Electric Steel Corp. (Roanoke, Va.) this country's first commercial plant for continuously casting steel. Cast pieces will be square bars 3 to 6 in. per side. The continuous casting is done by pouring molten steel from the top of a 75-ft. tower.

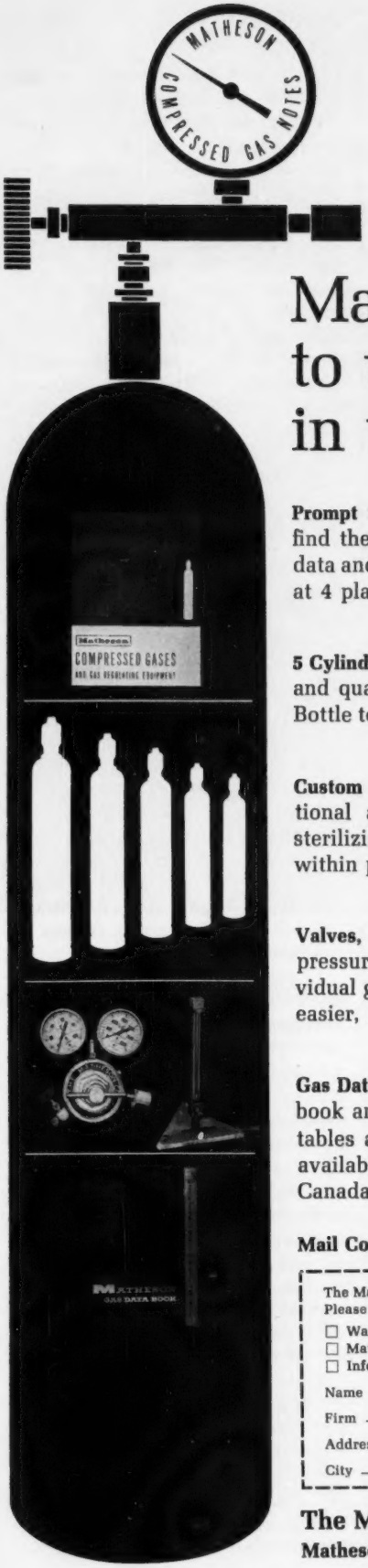
•

Plating Transistors: Dissolved iron is the key to manufacturing microalloy transistors in a new Australian patent application (63,685/60) submitted by the Philco Corp. The process involves plating germanium blanks with indium by means of a jet of indium salt. The indium is precipitated onto the surface of the blank by an electric current. And at the same time, the electrodes supplying the current are soldered to the plated germanium transistor by means of connecting whiskers.

The trick is to get good adhesion while avoiding any deformation of the electrodes. In its patent application, Philco claims predetermined amounts of iron in the plating solution can accomplish this without adversely affecting the quality of the transistor.

•

Low-Shrink Rayon: Rayonier Inc. (New York) has improved the viscose process for producing rayon. In the first stage of the new process, viscose is spun in an acid regenerating spin bath while the filaments are stretched



Matheson makes it easy to use compressed gases in the lab or pilot plant

Prompt Shipment on 82 Compressed Gases from Acetylene to Xenon, you'll find them all in Matheson's Compressed Gas Catalog, together with prices, data and recommended controls. We stock them all, and maintain inventories at 4 plants in U.S. and Canada for prompt service.

5 Cylinder Sizes: Order compressed gas in the most convenient cylinder size and quantity. We're ready to handle orders ranging from a 5 ounce Lecture Bottle to a carload of No. 1 cylinders.

Custom Mixtures: Matheson specializes in custom gas mixtures — for proportional and Geiger counter units, instrument filling, special atmospheres, sterilizing, etc. We will prepare any gas mixture to your specifications, usually within plus or minum 1% absolute. Exact analysis available.

Valves, Accessories: The Matheson Catalog lists a complete line of valves, pressure regulators, flowmeters and other accessories tailored to fit individual gas requirements. Matheson engineered equipment makes gas handling easier, safer and more precise.

Gas Data Book: The Matheson Gas Data Book is the most comprehensive fact book and use manual on compressed gases ever published. Its 444 pages, 68 tables and 68 charts contain essential information on every compressed gas available for laboratory use. Order direct, at $8.00 postpaid in U.S. and Canada.

Mail Coupon for Catalog, Bulletins

The Matheson Company, Inc., P. O. Box 85A, East Rutherford, N.J.
Please send the following:

- ☐ Wall Chart: Safe Handling of Compressed Gases
- ☐ Matheson Gas Catalog
- ☐ Information on Matheson Gas Data Book, 3rd Edition

Name _____

Firm _____

Address _____

City _____ State _____

The Matheson Company, Inc., East Rutherford, N.J., Joliet, Ill., Newark, Calif.
Matheson of Canada, Ltd. Whitby, Ont.

at least 90%. The filaments are then placed in a hot acid bath containing 1-6% sulfuric acid. Here the filaments are stretched an additional 5-50% to completely fix and regenerate. Then complete relaxation of the filaments is accomplished in an aqueous solution of 0.1-2% sodium hydroxide at high temperature. The final product is a washable filament having practically no shrinkage. It can be converted into yarns and woven fabrics that will not shrink under repeated laundering. This process is now being patented under Australian patent application 63,598/60.

•

Hungarian Hydrocracking: Hungarian research, sparked by the high-sulfur Russian crude oils fed to Hungarian refineries, has brought out a novel modification to conventional hydrocracking. This version, called the Varga process, is said to be good for heavy crudes, reduced crude oil (from which the gasoline, petroleum gas and kerosene are removed) and shale oil. It yields a desulfurized naphtha ready for reforming to high octane gasoline and a diesel oil ready for use in engines without further treatment.

Key to the process is dilution with refractory oils, such as aromatics, middle distillates, heavier lubricating oils, etc. These are blended with the sulfuric feed prior to a two-stage liquid-phase hydrocracking process at "medium" (1000 psi.) pressure.

In the process, the crude oil is diluted (about four to one), mixed with hydrogen, and passed through heat exchange. After this, it is mixed with a catalyst paste (iron oxide on brown coal or coke) and passed through a fired heater to the reactors where the hydrocracking reaction takes place at 820 F. Leaving this first bank of reactors, the cracked oil passes to flash tanks where the light oils are separated as vapor from the diluent, heavy oil and catalyst. The vapor passes through a conventional hydrocracking reaction over a fixed-bed catalyst, while the heavy oil is separated from the diluent (which is recycled).

Tuymazin crude oil (1.88% sulfur, 8.4 Conradson test for coke and 0.934 specific gravity) typically yielded a naphtha with a 65.5 octane number (9.9%), gas oil (54.4%) and a "heavy oil" (14.2%). The process has been worked out by the Hungarian High Pressure Research Institute.

Pittsburgh Chemical's new maleic anhydride plant at Neville Island, Pa.

"...to help you make better products...at a better profit."

Last year, Pittsburgh Chemical Company set forth this credo . . . "to help our customers make better products . . . at a better profit."

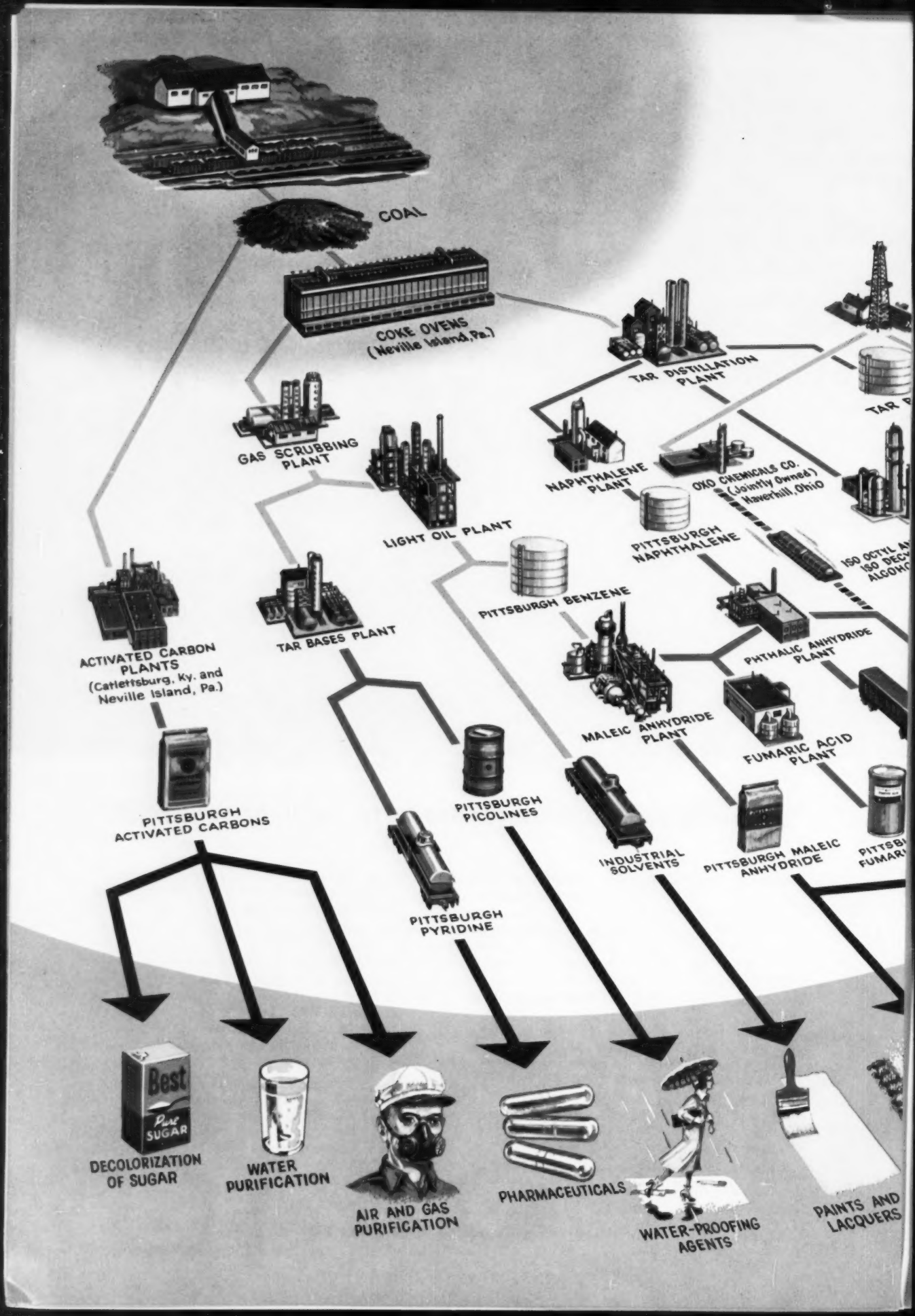
In essence, this was a pledge to contribute to the *growth* of our customers. And to make this pledge meaningful, the company embarked upon a vigorous new growth program of its own.

In the past twelve months, Pittsburgh Chemical Company has:

- Completed a new multimillion dollar Activated Carbon plant near Ashland, Ky., to meet the constantly increasing demand for the coal-derived adsorbents which Pittsburgh developed.
- Completed a new 20 million pound-per-year maleic anhydride plant, rounding out the company's basic position in major dibasic acids.
- Formed, as co-owner with Amoco Chemicals Corp., the Oxo Chemicals Co. Construction of a modern oxo alcohol plant will begin this year at Haverhill, Ohio.
- Completed expansion of phthalic anhydride production facilities and initiated action to further increase plasticizer capacity.
- Launched an aggressive marketing program for Pitt Chem Pipeline Coatings and the complete line of Pitt Chem *Tarset*, *Tarmastic* and *Insul-Mastic* industrial coatings, oriented to the economical solution of corrosion problems on an industry-by-industry basis.

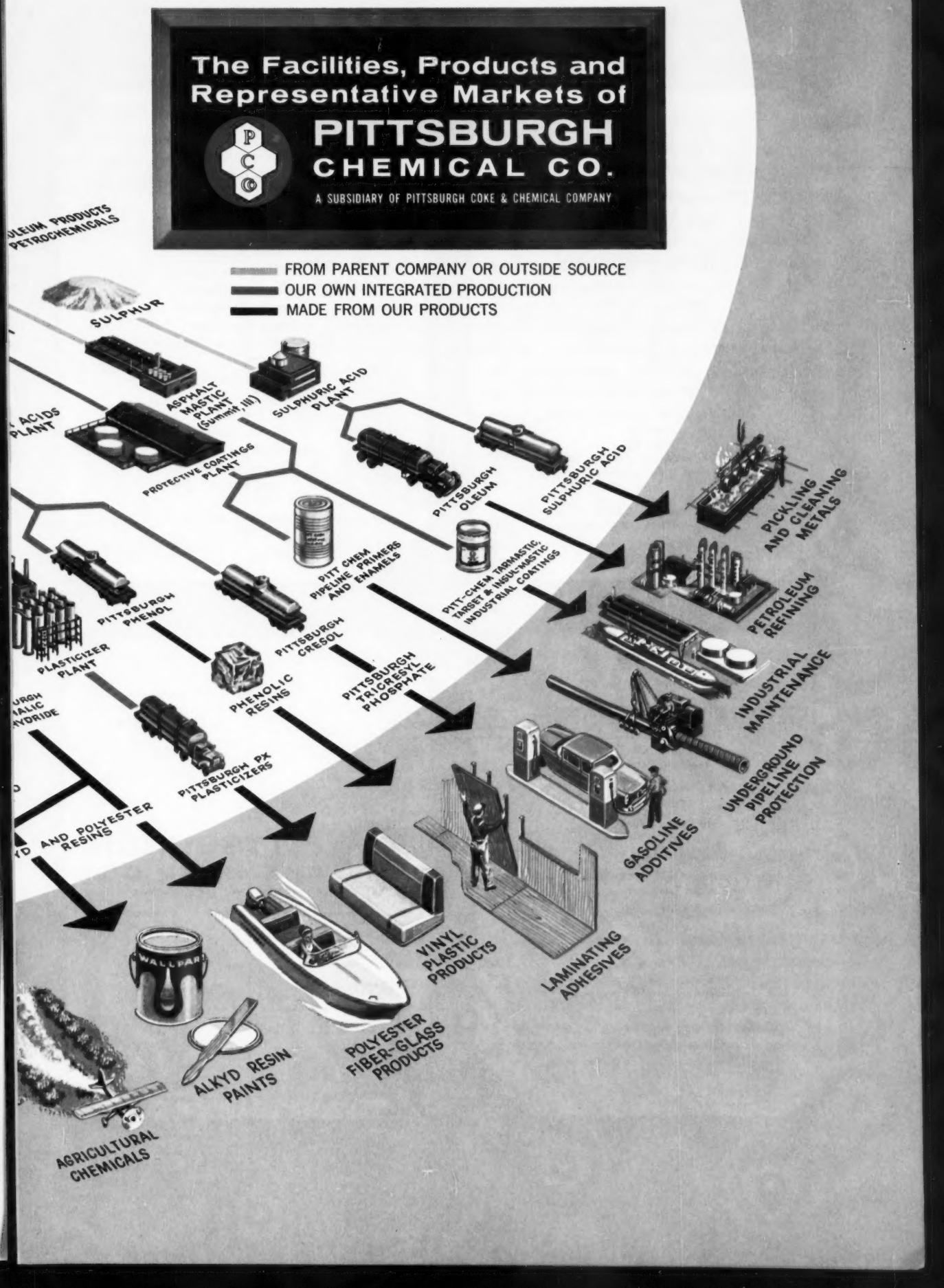
Through this continuing program of growth—in our services as well as our facilities—perhaps Pittsburgh Chemical can help *your* company create *a better product . . . at a better profit.* We've done it for others . . . we'd like to show you how we can do it for *you.*

Interested in our latest "family portrait"?


COAL
COKE OVENS
(Neville Island, Pa.)
TAR DISTILLATION PLANT
GAS SCRUBBING PLANT
LIGHT OIL PLANT
NAPHTHALENE PLANT
OXO CHEMICALS CO.
(Jointly Owned)
Haverhill, Ohio
PITTSBURGH NAPHTHALENE
PITTSBURGH BENZENE
ACTIVATED CARBON PLANTS
(Catlettsburg, Ky. and Neville Island, Pa.)
TAR BASES PLANT
PHTHALIC ANHYDRIDE PLANT
MALEIC ANHYDRIDE PLANT
FUMARIC ACID PLANT
PITTSBURGH ACTIVATED CARBONS
PITTSBURGH PICOLINES
PITTSBURGH PYRIDINE
INDUSTRIAL SOLVENTS
PITTSBURGH MALEIC ANHYDRIDE
Best
Pure
SUGAR
DECOLORIZATION OF SUGAR
WATER PURIFICATION
AIR AND GAS PURIFICATION
PHARMACEUTICALS
WATER-PROOFING AGENTS
PAINTS AND LACQUERS

The Facilities, Products and Representative Markets of PITTSBURGH CHEMICAL CO.

A SUBSIDIARY OF PITTSBURGH COKE & CHEMICAL COMPANY



And a few last-minute snapshots

Products of the

Activated Carbon Division

Pittsburgh Granular Carbons

Type SGL
for corn sugar refining

Type CAL
for cane sugar refining

Type OL
for chemical purification and decolorization

Type GW
for purification of industrial and municipal water supplies

Type BPL
for catalytic support, solvent recovery and removal of contaminants from gas streams

Pittsburgh Pulverized Carbons

Type RB
Type RC
for purification and decolorization of chemicals, pharmaceuticals and food products

Sales Offices: Pittsburgh • Trenton • Nashville • Chicago • Houston • San Francisco

Products of the

Industrial Chemicals Division

Phthalic Anhydride
Maleic Anhydride
Fumaric Acid
Phthalate Plasticizers
Adipate Plasticizers
Sebacate Plasticizers
Epoxy Plasticizers
Tricresyl Phosphate Plasticizer
Phenol
Ortho Cresol
Meta Para Cresol
Pyridine
Alpha Picoline
Refined Mixed Picolines
Sulphuric Acid
Oleum

Sales Offices: Pittsburgh • New York • Chicago

Products of the

Protective Coatings Division

Pitt Chem® Coal Tar Pipeline Enamels

Pitt Chem "Quick-Dry" Pipeline Primer

Pitt Chem "Tarset"® Coal Tar-Epoxy Resin Coatings

Pitt Chem "Tarmastic"® Coal Tar Coatings

Pitt Chem "Insul-Mastic"® Vaporseal Gilsonite-Asphalt Coatings

Pitt Chem "Insul-Mastic"® Insulating Gilsonite-Asphalt Coatings

Nationally distributed thru direct sales representatives, manufacturers agents and leading industrial distributors throughout the United States.

PITTSBURGH CHEMICAL CO.
GRANT BUILDING PITTSBURGH 19, PA.
A Subsidiary of PITTSBURGH COKE & CHEMICAL CO.

Printed in USA

Technology
Newsletter

CHEMICAL WEEK
June 10, 1961

The future of gas-cycle pebble-bed processing for an advanced nuclear reactor is still clothed in confusion. The Atomic Energy Commission's Reactor Development Div. says development is advancing satisfactorily. But some economic problems have cropped up in fuel fabrication. The system would employ high temperatures, be fueled by uranium-alumina spheres. It offers considerable promise of economic advantages. Among them: a long "burn-up" (*CW, Nov. 5, '60, p. 59*).

But so far at least, the small (6-8 mil.) balls have not proved capable of containing radioactive fission products over extended periods. So the system may have to use a contaminated fuel. This would hike material costs, cut into power economics. However, it's conceivable that later tests would be able to confirm the desired long burnup.

This is a source of concern to Sanderson and Porter, the architect-engineer for original reactor design. Its complaint: it spent considerable money of its own in designing the complex. And AEC has still not clearly stated whether or not an experimental reactor is planned. The firm is left with a nuclear staff—with no workload.

AEC counteracts this by pointing out that no commitment to build was ever given to the architect-engineer. It feels that results of the fuel test development must be in and weighed before a decision on building can be reached. And that will take considerable time, possibly one or two years.

•

Long range hopes of a chemical cure for cancer received boosts from two quarters:

• The Veterans Administration has revealed production of synthetic Cytolipin H, a glyco-lipid which appears in the first tests to be "identical to a naturally occurring chemical detected in high concentration in most cancer cells." It is hoped that the new synthetic will provide researchers with new insight into cancer mysteries, eventually speed development of effective vaccines.

• Earlier last week, Surgeon General Luther Terry stated that a Lederle drug, Methotrexate, was effective in bringing five-year remissions in some cases of choriocarcinoma, a relatively rare form of cancer. The drug, which Lederle developed in '48, is a folic acid antagonist that, the company says, has been widely used in therapy for leukemia and certain kinds of solid malignant tumors. Its promising significance, however, is that it shores up hope for an eventual effective chemical weapon against cancer.

•

Petroleum companies switching to coal as their energy source? That's what Anton Zischka, German author of energy books, said at a

talk in Essen last week. Basing his feelings on a recent tour of the U.S., Zischka said that U.S. oil companies are investing large sums in coal reserves.

He said further that Gulf Oil has a big share in the coal industry and has worked up coal gasification and liquefaction processes that he implies are ready to compete with oil-based processes for turning out gasoline and gas.

This would seem to be a highly optimistic outlook for coal, however, and one that is hard to find among coal people themselves in the U.S. The technological problems involved in processing coal, the ease of handling and still-plentiful supplies of petroleum in the U. S. all would argue against Zischka's position.

•

Production processes for vaporizing materials at 3000-7000 F, then recondensing them into sub-micron powders is the goal of a new Air Force contract awarded to Vitro Corp. of America. The firm will work with metals, carbides and oxides, convert them to high-purity, ultrafine (0.01-0.1 micron) particles.

The idea is to improve density, compressive and structural strength and other properties for space and missile applications. The theory is that such properties improve with decreasing particle size.

•

Two late developments in obtaining fresh water from salt or brackish sources:

• The first U.S. experimental conversion plant to extract fresh water from the sea completed its design production test. Chicago Bridge & Iron Co., prime contractor for the plant, reports that the unit produced 8 million gal. of potable water from the Gulf of Mexico over an eight-day period. Located at Freeport, Tex., it's designed to produce 1 million gal. of water daily at a cost of under $1/1000 gal.

• Fresh water has been obtained from brackish water in southwest Africa for 54¢/1000 gal. says Aqua-Chem (formerly Cleaver-Brooks Special Products). The process employed was a Netherlands-developed electrodialysis one to which Aqua-Chem has obtained exclusive North American manufacturing rights. Aqua-Chem has been working on flash-evaporation and vapor-compression plants and has built 4000 units having a total fresh water capacity of 15 million gal./day.

•

Du Pont is closer to commercial production of polypropylene. It will undertake a "market evaluation" program late next month. Output from the company's pilot plant will be supplemented by purchased resin (made to Du Pont specifications) from Hercules Powder.

Nike-Zeus Missile roars aloft from White Sands Missile Range

IMPACT!

New Plas-Tech Full-Range Universal Tester helps Grand Central Rocket Conquer Rocket Grain Integrity Problems

THE PROBLEM — The research team at Grand Central Rocket Company was challenged by the need for design criteria for both large and small solid propellant rocket motor grains. A fundamental requirement in developing these criteria was physical characterization of the viscoelastic propellants in tests simulating the storage, transportation, ignition and launch forces imposed on rocket grains.

THE SOLUTION — Grand Central contacted Plas-Tech. To meet its stringent requirements a PLASTECHON Model 591A Universal Tester (capacity 2,500 pounds; stroke 10 inches; speed range 0.2 to 8,000 inches/minute) was provided. Assisted by this equipment Grand Central is now able to measure and study the time-dependent physical behavior of propellants under both low-force, long duration and high-force, short duration conditions.

The precision physical data obtained in PLASTECHON propellant tests is now used at GCR in designing rocket grains for superior structural integrity and reliability.

THE VERSATILITY — All seven design parameters . . . stress at yield, stress at fail, elongation at yield, elongation at fail, modulus of elasticity or stiffness of material, work to yield, work to fail . . . are now available via PLASTECHON instrumentation over the entire range of equipment performance.

PLASTECHON Universal Testers are so versatile that their ultimate usefulness has yet to be explored, as evidenced by the wealth of new information already provided to the rubber, plastics, metals, textile and paper industries. Standard models are available at loading rates from 0.2 to 15,000 inches/minute with prototype units capable of loading rates up to 200,000 inches/minute.

To broaden your knowledge of your product, write or call Plas-Tech for complete information and data.

Model 591A Plastechon Universal Tester

NEW DIMENSIONS IN MATERIALS RESEARCH

plas-tech EQUIPMENT CORPORATION

4 MERCER ROAD, NATICK, MASSACHUSETTS

OVERSEAS REPRESENTATION AD. AURIEMA, INC., NEW YORK

THE LITHIUM REACTOR

CURRENT INFORMATION ON LITHIUM CHEMISTRY AND METALLURGY

New Beryllium Company Formed

LCA and The Alloyd Corporation Combine Technical and Production Resources in New Venture

Lithium Corporation of America and The Alloyd Corporation have announced the formation of a new, jointly-owned company, Beryllium Metals & Chemicals Corporation.

The new Company will engage in beryllium research and in the purification and production of beryllium metals and chemicals. This move coincides with recent widespread interest in new applications for the metal. One of the lightest of structural metals, beryllium has a vast potential in jet and space craft. It also possesses valuable properties in the nuclear-energy field, owing to its low absorption and high scattering cross section for thermal neutrons.

Beryllium Metals & Chemicals Corporation will be headed by Dr. B. L. Averbach, President, who will also be in personal charge of the Company's research program in its initial stages.

The Company will combine the extensive experience in beryllium technology of The Alloyd Corporation with LCA's long experience in extractive metallurgy and production of lithium metal and lithium chemicals. Both Companies will contribute technical personnel to the venture for the development work to be conducted at Alloyd's laboratory. According to present plans, the production facilities of Beryllium Metals & Chemicals Corporation will be established at Bessemer City, N. C., in the immediate vicinity of LCA's chemical plant.

LITHIUM IN BRIEF

New developments involving lithium are constantly appearing in the literature. Each month some will be mentioned here briefly.

Design parameters and calculated weights and efficiencies are given for magnetic induction lithium plasma engines. Engines with specific impulses of 3000 and 10,000 sec are considered. (4665-J)

Lithium and alkyllithium are cited as catalysts for polymerizing isoprene. The effect on stereospecificity of such polymerization by small amounts of tetrahydrofuran is shown. Polymerization of methyl methacrylate by alkyllithium is discussed, with emphasis on the role of lithium ion solvation. (4666-P)

Resistivity of sodium glasses is increased by partial replacement of SiO_2 with Li_2O. Lithium ions can be considered as fixed and behave as large divalent ions. (4675)

Adding lithium hydroxide to the electrolyte of an alkali-zinc battery has been shown to have a beneficial effect on the powdered zinc electrode with regard to aging. (4316)

The utility and properties of lithium borosilicate, metatantalate, titanate and zirconate are presented and discussed. (4535)

A theoretical study of specific impulse and thrust from a propellant containing hydrogen mixed with additives is presented. Curves are plotted for the additives Li, LiH and LiF. (6053)

A recent study describes the use of a mixed ether-THF solvent to improve the yield of diphenylether dimetalation with butyllithium as well as the reactivity of functional groups with Ph_3SiLi and reactivity of the latter compared with other organometallics. (6070)

A discussion of raw materials for high temperature ceramics presents crystallographic data and melting points for lithium aluminate, cobaltite, metagermanate, oxide and metasilicate. (4529)

Properties of lithium are reviewed pertinent to its use for underwater propulsion. Graphs indicating performance are included. (6016)

The infrared spectra of organolithium compounds are observed and inferences drawn on the nature of the C-Li bond. (6019)

For further information, write our Technical Service Department, Bessemer City, North Carolina.

TWO NEW COMPOUNDS AVAILABLE FROM LITHIUM CORPORATION OF AMERICA

Two versatile new compounds are now available in research quantities of 50-100 gms from Lithium Corporation of America.

2,6-Dimethoxybenzoic acid is available from LCA in the form of white-to-light tan crystals, with a melting point of 186-188°C. The chemical is used in organic synthesis as an intermediate for preparation of amides, esters, alcohols and other compounds. It is a key intermediate in the preparation of gamma-resorcyclic acid, which has been reported as having activity against rheumatic fever.

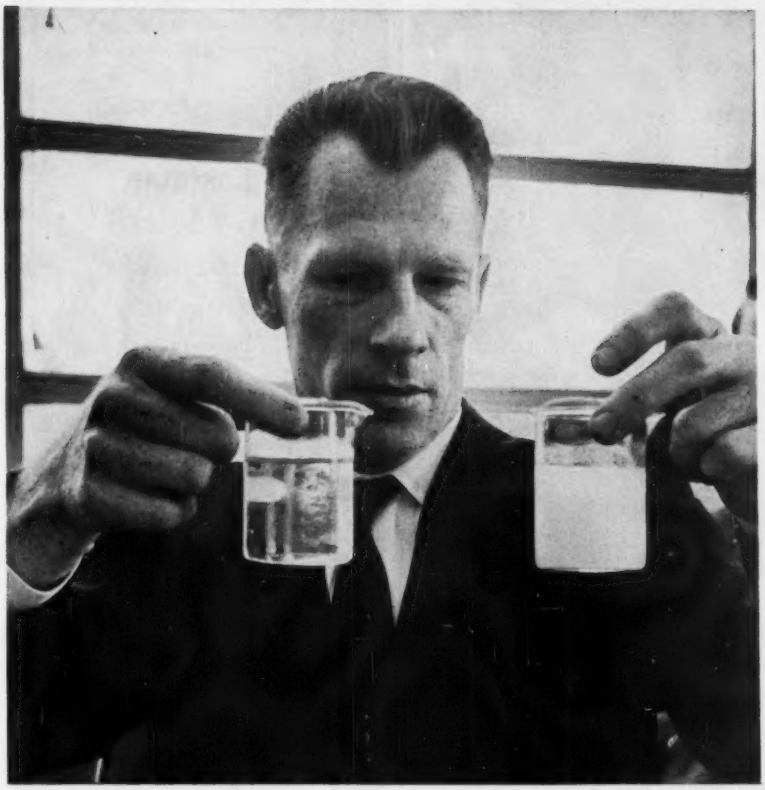
2,6-Dimethoxyphenyllithium is a white-to-tan free-flowing powder with a neutralization equivalent of 142-146, essentially free of lithium halides, nonpyrophoric, and moderately soluble in hydrocarbons. Especial importance is indicated for the compound in pharmaceutical production and as a stereospecific catalyst in manufacture of butadiene-styrene rubbers. Its solubility in hydrocarbons makes it highly advantageous where the presence of other solvents such as ether is undesirable. It reacts readily with water, acids, ketones, esters, anhydrides, acid halides and other common organic and inorganic chemicals to form a variety of useful compounds.

Data sheets on these two new compounds are available on request.

NEW ISSUE OF LITHIUM BIBLIOGRAPHY

The eighth supplement of the "Annotated Bibliography on the Use of Organolithium Compounds in Organic Synthesis" is now available from Lithium Corporation of America. It contains 620 abstracts of technical papers published in 1960, and contains an authors' index as well as subject references.

Copies may be obtained for $3.00 each from the Company's Technical Service Division, Box 428, Bessemer City, N. C. A limited number of earlier volumes are also available.



CW PHOTO—JOAN SYDLOW

GK's Bundy compares untreated with new non-wetting clay (left).

Teaching Clay New Tricks

At this week's National Plastic Exposition in New York, producers of paint, plastic and rubber products will get their first public view of a new specialties material designed as an extender for their products: a hydrated aluminum silicate pigment developed by Georgia Kaolin Company (Elizabeth, N.J.). Its chief claim to fame: hydrophobic characteristics, which appear to surpass those of any clay now on the market (see picture, above).

The material, tradenamed RER-45, is an example of a growing trend on the part of clay suppliers to build new properties into their products. For instance, Georgia Kaolin in '58 began applying a surface coating (1% by weight) to its kaolin (China Clay), to give it better compatibility with moderately-high-polarity resins — e.g. polyesters, alkyds and epoxies. It called these pigments REA-7 and REA-45 (the numerals designate particle size).

Early this year the company developed another series of modified clays called REM-5 and REM-2. Instead of a resin treatment, they received a surface modification to help eliminate absorption of water.

Another example of this trend: the treatment of kaolin with aluminum phosphate to give this material increased whiteness and brightness for paper coating and filling applications. This method was pioneered and patented by Southern Clays (New York). Yet another clay treatment is the modification of kaolin with rosin amine stearate, pioneered by Minerals and Chemicals Corp. of America (Menlo Park, N.J.). This method has been used since the mid '50s in paint and plastic systems for better water-resistance and improved settling.

National Lead (New York) sells an upgraded bentonite under its Bentone tradename. The product is treated with fatty acid amine to improve flow and other properties.

Other clays, such as attapulgus, have been experimentally surface-treated, but little appears to have been done on a commercial scale.

Price is Right: One reason why clay suppliers are interested in producing surface-treated clays is the premium price such products command. Whereas an untreated paper or rubber-grade extender might cost $10-35/ton, the surface-treated materials will sell for five or six times that price.

Georgia Kaolin produces its new pigment through a combination of the resin treatment and the surface modification. The material cannot be wet with water, according to Dr. W. Bundy, head of research at GK's Elizabeth, N.J., labs.

He tells CHEMICAL WEEK that the material has excellent compatability with organic systems of low and medium polarity. In mineral oil, 20% RER-45 (which averages 4.5 micron particle size) gives a viscosity of 300 cp (Brookfield Viscometer at 10 rpm) while untreated extended clay gives a reading of 4800 cp. Another example: 40% RER-45 in polyester resin results in a viscosity of 6700 cp, while untreated extender gives a viscosity of 15,000 cp.

Most kaolin-type extenders go into paper applications (demand is around 1.6 million tons/year for that use) and into ceramics (about 300,000 tons/year). However, the main use of the new materials is in smaller-volume applications such as plastics (which use 15,000 tons/year of kaolin), rubber (285,000 tons/year) and paints (50,000 tons/year).

In particular, GK believes RER-45 will be useful in automotive primers. Hydrophilic untreated clay pulls water into the system, giving poor results in salt spray tests. In a prime coat, the extender would be used at a rate of ½-2 lbs./gal.

The new extender helps to maintain high dielectric strengths in polyvinylchloride systems and should find use where high humidity poses a problem in PVC applications.

GK now produces pilot quantities of the new material in four particle sizes (0.2, 0.5, 0.7, 4.5 microns) at its Dry Branch, Ga., plant. Full-scale production should begin in about a month. Price will range from about $60 to $150/ton.

American Snuff's Condon: He piloted the move into insecticides.

From Snuff to Specialties

"If our snuff or chewing tobacco business should vary more than three or four percent from one year to another it would scare us to death." Evident in this statement by Martin J. Condon, III (above), President of American Snuff Company (Memphis, Tenn.), is the reason for his launching the company into a diversification program that's now showing signs of paying off.

The snuff market is relatively stable, offers little promise of expanding. Thus, several years ago, Condon, who runs the 61-year old company, began to cast about for new product lines with strong growth possibilities. Result: American Snuff is now manufacturing household and garden insecticides and room deodorizers in its wholly owned Memphis subsidiary, Hot Shot Quality Products, Inc.

Proof of the wisdom of this move can be seen in the firm's steadily rising sales. In '57 total company sales were $19 million; last year they hit $24 million. Although Condon won't release a breakdown on the sales figures, he does say: "The increase hasn't come from snuff."

Additional evidence of how the four-year old Hot Shot line is faring is Condon's appraisal of his position in the industry. "We figure we probably rank fourth in sales among companies selling household insecticides." (In his opinion the first three are Boyle-Midway Div. of American Home Products, S. C. Johnson & Son, and Cook Chemical Co.) Says Condon: "This is a $135-million/year market—if we can get 10% of it, we'll have a good hunk of business."

Filling the Bill: Several important factors dictated the selection of the diversification route. Household insecticides seemed to fill the bill from the standpoint of the over-all consumption trend; and more significantly, from the standpoint of the adaptability of these products to American Snuff's existing sales and merchandising setup.

In the spring of '57, the company took its first step toward the insecticide market.

American Snuff entered the insecticide business through the purchase of R & H Products Company (Memphis, Tenn.). This company owned and distributed Hot Shot Bug Killer. It had no plant—the product was packaged by a contract filler, and sales were only a few thousand dollars yearly. "We actually acquired only the right to use the trade name "Hot Shot,"

"The customer was wrong...but we were right on time"

...recalls production supervisor, Acid Division

"It started with a phone call from one of our regional sales managers asking about a tank car of acetic anhydride that hadn't arrived at the customer's plant.

"Seems they were in full production on their line of antibacterial drugs. Anhydride supplies were running low and the purchasing agent was getting pretty uneasy.

"Well, we turned to the files to see what had happened, but we couldn't find the order. So we searched again and then we re-searched. Found an old office procedure we never knew we had—but not a trace of the order.

"Our sales office called the purchasing agent back and with considerable embarrassment told him we had looked high and low but simply couldn't find any record of the order. The purchasing agent comes back with—'Of course you couldn't find the order. One of our *ex*-employees forgot to mail it. It's still here in the office.'

"Then he told us their production units would have to shut down if they didn't get delivery by 8:00 A.M. on the second morning. Could we help them out.

"By this time the day was well along and our loading crew had already gone to dinner. We located two tank trucks in a hurry and recalled the crew who loaded the anhydride (that's me leaning on the clipboard) and had sample analyses run immediately. With the help of our friends over at the Mason-Dixon truck terminal the shipment went out that night.

"The trucks had sleeper cabs and two drivers. Driving night and day, they covered the run of more than 800 miles in time to arrive at the customer's receiving platform the next night—well in advance of our customer's deadline."

A typical delivery? No! But typical of the interested personal service you can always expect when you buy from Eastman.

Eastman CHEMICAL PRODUCTS, INC., KINGSPORT, TENNESSEE, Subsidiary of Eastman Kodak Company

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Boston; Buffalo; Chicago; Cincinnati; Cleveland; Detroit; Greensboro, North Carolina; Houston; Kansas City, Missouri; New York City; Philadelphia; St. Louis.
West Coast: Wilson & Geo. Meyer & Company, San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

says Condon. He adds, "We had over 200 salesmen on the road calling on retail grocers, tobacco stores, drug stores and wholesale distributors. This type of selling organization meant that we could add insecticide products to our line without materially increasing our cost-per-call."

Product development of the Hot Shot line has been carried out with the assistance of Southwest Research Institute.

Hot Shot, however, also has its own laboratory, manned by a chemist and technician, who do both quality control and product development.

Steady Buildup: Hot Shot is steadily building up its line of products. The first product was the formulation for the bug killer purchased from R & H Products. Then an insect spray, house and garden spray and dry fly bait were developed with the assistance of SRI. These were followed by a personal insect repellent (Skram) and a room deodorizer (Bingo), which were developed by the Hot Shot laboratory.

The Hot Shot products are promoted as top-quality products, competitively priced. The company doesn't suggest a selling price—leaves that to the retailer. Generally the price

DIMENSION

Snuff: Lots of Life in the Old Business

The American Snuff Company first appeared in 1900, as a subsidiary of American Tobacco Co. When the tobacco trust of American was dissolved under an antitrust decree in 1912, its snuff business was spun off into three companies: the present American Snuff Co., George W. Helme Co. (New York) and Weyman-Bruton Co. (Nashville), now a part of U.S. Tobacco Co.

These three companies currently account for over 90% of the country's $50-million snuff market. American Snuff and U.S. Tobacco probably each account for 35% of this market; Weyman-Bruton for around 25%.

Martin J. Condon III, president of American Snuff, started as a $25/-week clerk in the sales department, became president in '49. His grandfather, Martin J. Condon, was first president of the company from its formation until his death in 1940.

While Condon is enthusiastic about his entry into insecticides, he's quick to emphasize that snuff production is still a healthy business. At present, American Snuff's snuff sales are greater than those of chewing tobacco and insecticides combined. Snuff showed a 3% increase in national production last year; output totaled 34.7 million lbs. (Top year: '45 with 43 million lbs.) Top states for snuff sales are Texas and Minnesota (the Scandinavians brought the snuff habit to this country).

Top snuff-consuming regions are the Southeast, Southwest and Northwest. Selected heavy industrial areas are especially good outlets because snuff often replaces the forbidden cigarette on the job. This is also true of oil fields and refineries.

Snuff's companion product, chewing tobacco, has roughly a $65-million/year market in the U.S. and American Snuff has about 8% of it. American Snuff entered the chewing tobacco business with the purchase of Taylor Brothers (Winston-Salem, N.C.) in '52. All chewing tobacco manufacturing is done at Winston-Salem. Half of the snuff production is carried on at the company's Clarksville, Tenn., plant and half in Memphis. There are leaf storage houses, warehouses, leaf grading, and rehandling plants at Hopkinsville and Mayfield, Ky., and in Clarksville and Springfield, Tenn.

American Snuff's principal snuff brands are: W. E. Garrett & Sons Scotch; Honest Scotch; Dental Scotch; W. E. Garrett & Sons Sweet; Dental Sweet, and Peach Sweet. Principal chewing tobacco brands are: Bull of the Woods; Black Maria; Red Coon; Rose Bud; Penn's Natural Leaf; Piper Heidsieck and Favorite.

The company has district offices in Dallas, Houston, Shreveport, Memphis, Knoxville, Los Angeles, Philadelphia, Richmond, Charlotte, Columbia (S.C.), Atlanta, Chicago, Clarksburg (W.Va.), Raleigh, and Birmingham. Each of these offices is staffed by a division manager and approximately twelve salesmen.

New VARSOL®
For Long Lasting Sweetness!

"Why the enthusiasm? Because users of new, improved Varsol find that it keeps its long lasting sweetness after numerous processings or long storage periods. A unique hydrofining process, developed by Esso Research, makes possible this major solvent development. Quality controlled Varsol, like all Esso solvents, reaches your plant fresh, uniform and on schedule from modern, conveniently located storage terminals. For further information or expert technical assistance call your Esso Representative or write to us at 15 West 51st St., N.Y. 19, N.Y. (And tell 'em Nosey sent you!)" *Nosey*

ESSO STANDARD, DIVISION OF
HUMBLE OIL & REFINING COMPANY

spread may range up to ten cents on all of the products, depending on the markets compared.

The 28,000 sq.-ft. Hot Shot plant, which adjoins the 300,000 sq.-ft. Memphis tobacco products factory, is four years old and its equipment is highly automated. On the filling line for bottles and cans, capacity is 250 pints or quarts/minute. The aerosol cold-load line has a rate of 60 cans/minute while the pressure filler (which handles the 14 ounce Bug Bomb) turns out 120 cans/minute.

Products are currently being sold in a gradually spreading area, which now includes the District of Columbia, Maryland, West Virginia, North and South Carolina, Georgia, Florida, Kentucky, Tennessee, Mississippi, Oklahoma, Arkansas, Texas and New Mexico, as well as the major metropolitan areas throughout most of the country. They are not sold on the West Coast or in New England because of freight rate problems. Products are warehoused in leased space in Jacksonville, Tampa, El Paso, Houston, Dallas, Atlanta, and Winston-Salem.

Condon is mum about the size of his advertising or promotion budget either for tobacco or insecticide products, says only that the company relies heavily on market-saturation advertising.

Condon won't make any predictions about what products Hot Shot may bring out in the future, but he does say that "anything that goes into an aerosol is a potential."

Japan Paints Up

The Japanese paint industry, like its U.S. counterpart, is enjoying brisk business. The Japan Paint Industry Assn. has disclosed the following figures. Last year, a total of 327,825 tons of paints of all varieties were produced, an increase of 22.5% over the quantity turned out in the year before. Of this figure synthetic resin paint accounted for 89,616 tons, an increase of 32.6% over the '59 figure.

Japan exported 2,950 tons of paint worth $1.3 million in '60. This year the aim is for an export figure of 4000 tons, worth about $1.7 million. Over-all production targets are for an average annual increase of about 10% each year in the '61-64 period.

EXPANSION

Long Way from St. Louis: Carboline International Corp. (St. Louis, Miss.), has set up a new subsidiary, Carboline-Mexico, to make Carboline's line of protecting coatings in Mexico. The new operation will be owned 50% by Silicatos Solubles De Mexico, S.A. and 50% by Carboline International. The new venture is the third foreign one for Carboline in the last 12 months: Carboline-France and Carboline-Dex of Australia were established in that period.

•

Adds Research Labs: Pecora, Inc., (Philadelphia) manufacturers of sealants and adhesives, has added product development facilities at both its Philadelphia and Garland, Tex., plants.

•

Phoenix Fabricated Fluorocarbons: The Fluorocarbon Co. (Anaheim, Calif.) has established a Phoenix, Ariz., subsidiary, Fluorocarbon of Arizona, Inc. The subsidiary will operate as a custom fabricator of Teflon and Kel-F products, will begin production this June.

•

Resins Rep: Isochem Resins Co. (Providence) has appointed Panther Sales Co. (Paterson, N.J.) as its representative in New York and New Jersey for Isochem's line of epoxy adhesives, potting compounds, silicone rubbers and various other products.

PRODUCTS

Fire-Retardant Finish: Empire Coatings and Chemical Co. (5631 Raritan St., Denver) is selling a fire-retardant coating that withstands blasts up to 5500 F at Mach IV velocity. Hel-Met can be applied (like paint) on interior surfaces such as wood, cellulose, paper, plaster or metal and is available in decorator colors. It can be washed with mild soap or detergent.

•

Tamperproof Seal: PharmaPlastics, Inc. (205 South Smallwood St., Baltimore, Md.), is now selling a tamperproof seal for aerosol cans. The plastic caps can be used with standard valves and overcaps. The seal is easily torn off for use of the product and cannot be replaced, making presale tampering readily discernible.

cost-price pinch getting **TIGHT?**

the water out of your TSP Budget

with fmc®

TRISODIUM PHOSPHATE ANHYDROUS

If you now use TSP crystals in a process where the anhydrous form would work just as well, *you can save money two ways* by changing from one to the other.

First, when you use FMC TSP Anhydrous your shipping costs are cut 56% because you *don't* ship that much water.

Second, and most important, material costs are cut substantially, saving you 14% of what you now pay for equivalent Na_3PO_4 content.

In addition, FMC TSP Anhydrous is freer-flowing, so it is easier as well as less bulky to handle and store.

Would you like us to quote specific savings that would apply in your case? Write or phone our nearest office today.

SODIUM PHOSPHATES Hexaphos® Sodaphos® Brands of Sodium Glassy Phosphate Disodium Phosphate Monosodium Phosphate Sodium Acid Pyrophosphate Sodium Tripolyphosphate Tetrasodium Pyrophosphate Anhydrous Tetrasodium Pyrophosphate Crystals Trisodium Phosphate Anhydrous Trisodium Phosphate Hemihydrate Trisodium Phosphate Monohydrate
POTASSIUM PHOSPHATES Dipotassium Phosphate Monopotassium Phosphate Potassium Tripolyphosphate Tetrapotassium Pyrophosphate Tetrapotassium Pyrophosphate 60% Aqueous Solution Tripotassium Phosphate
CDB® Chlorinated Dry Bleaches

fmc FOOD MACHINERY AND CHEMICAL CORPORATION ®

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Mineral Products Division

General Sales Offices:
161 E. 42nd STREET, NEW YORK 17

SPECIALTIES

Teflon: Du Pont is now offering Teflon FEP fluorocarbon resin in a dispersion or formulated spray finish. The dispersion is expected to find use as a Class H impregnant and surface coating for wire, cable, component insulation, and in electrical and chemical applications. Test-market price: $12/lb. (solids content) in 30-gal. drums.

•

New Latex Primer: Mary Carter Paint Co. (New York) claims to have developed a new acrylic latex base primer that eliminates the need for oil-base primers in exterior house painting. The product is called Roleze, dries in 4-6 hours. The company, which markets the product only hrough its 600 franchised stores, is asking $8.98/gallon (the second gallon is free) and has six colors available.

•

Porous Plastic: A porous plastic of high-density polyethylene will make ts U.S. debut at the current Plastics Exposition in New York. It's called Vyon and is manufactured by Porous Plastics Ltd. of Dagenham Dock, Essex, England. Applications include air and liquid filtration, air-fluidized powder conveying, filters for pneumatic equipment and use in de-ionizng equipment. It's also being used as breathable type of orthopedic splint. The company makes the product in stock sheets up to 32 in. square and from 1/32 to 2 in. thick.

•

Prevents Color Fading: Berkey Photo, Inc. (New York) has a process which is said to prevent fading of olor prints. Called Permacote, the material, a colorless liquid, is added during processing of a color print. The process will soon be available nationally at photofinishing counters. The photofinisher will send the customer's order to Berkey's New York City processing facilities, where the process will be applied without additional charge.

•

Sweeping Compound: An all-purpose sweeping compound with a low silica content and a paraffin oil base is being offered by Paxson Manufacturing Co. (State Rd., Philadelphia). It's called Paxson Sanitary Sweeping Compound, is green in color and supplied in 25, 50, 100 and 3000-lbs. steel or fibre drums.

Now Cyanamid Offers a Series of Cyquest* Sequestering Agents

to help remove traces of unwanted metallic ions—Check this chart... there's a Cyquest Sequestering Agent best for you

Sequestering Agent	Chemical Composition	Use
CYQUEST 40®	Tetrasodium ethylenediamine tetraacetate solution	General purpose sequestering agent for most metallic ions throughout the pH range; effective for iron in the acid pH range.
CYQUEST® 40-D	Tetrasodium ethylenediamine tetraacetate dihydrate	Used in place of Cyquest 40 when a dry form is needed.
CYQUEST® ACID	Ethylenediamine tetraacetic acid	Used in place of Cyquest 40 when the sodium ions are undesirable.
CYQUEST® 30-HE	Trisodium N-hydroxyethyl-ethylenediaminetriacetate solution	For control of iron in the alkaline ranges from pH 6.5 to 9.5.
CYQUEST® DEG	Sodium dihydroxyethyl glycinate	For iron control in alkaline range from pH 9.5 to 12.5.

*Trademark

CYANAMID

Cyanamid, with a wider series of sequestering agents, can now assist you better than ever in removing even traces of unwanted metallic ions from your product or process. All Cyquest Sequestering Agents are uniformly high in quality and provide maximum chelating activity. As with all chemicals from Cyanamid, you are assured of the finest in product, best in service and delivery. Why not send coupon today for more information?

AMERICAN CYANAMID COMPANY
Process Chemicals Department, 30 Rockefeller Plaza, New York 20, N. Y.

CWP-610

American Cyanamid Company
Process Chemicals Department
30 Rockefeller Plaza
New York 20, N. Y.

Please send me product data sheets on
CYQUEST SEQUESTERING AGENTS

Name_____

Company_____

Address_____

Position_____

Dry Nabam: Stauffer Chemical Company (New York) has begun marketing a dry form of Nabam, the agricultural fungicide, under the tradename Nabam 93-SP. Nabam (chemically disodium ethylene bisthiocarbamate) was formerly furnished only as a liquid. The new formulation is an instantly soluble, yellow, free-flowing powder mixed with a metallic sulfate (e.g. zinc sulfate). It's available from Stauffer in 50-lb. bags.

•

Foam Casting Sheet: A release paper which can be used as a casting sheet for polyurethane foam is being offered by Crocker, Burbank Papers, Inc. (Fitchburg, Mass.) under the name Stick-Not #561. It's available in rolls up to 83 inches wide is said to have extremely high tensile and tear strength.

•

Repair Compound: A new repair compound consisting of 80% bronze and 20% plastic is available from Devcon Corp. (Danvers, Mass.). It's tradenamed Devcon BR, is said to bond to iron, bronze, steel, aluminum, brass, wood, glass and other materials. Tensile strength is 9000 psi; compression strength, 20,000 psi. Shrinkage during hardening is about 0.0005 in. per inch. It's supplied in 1, 4 and 15-lb. packages.

•

Non-Burning Epoxy: A flame-retardant epoxy resin, Araldite DP-440, has been developed by Ciba Products Corp. (New York) for use in adhesives, tooling, flooring, laminating and electrical insulation applications. The resin is based on a series of halogen containing cycloolefinics, can be cured at room or slightly elevated temperatures with amine hardeners. Nonburning properties have been verified by the standard testing procedure of ASTM D-635, according to Ciba.

•

Rust Inhibited Paints: Colored aluminum paints with a rust-inhibitive base are being marketed by Subox, Inc. (Hackensack, N.J.). The paints, called Subalox Anodine Finishes contain flake pigment in a base of chemically active suboxide of lead. They are said to be the only colored aluminum paints made in the U.S. with a rust-inhibitive base. Four colors are now available; azure blue, mist green, golden beige and bronze.

Among the important factors in Shell Chemical's decision to make polystyrene were its extensive background in polymers and its raw material position. Two other Shell thermoplastics followed quickly—polypropylene and polyethylene.

BULLETIN:

On May 3, 1960, a remarkable thermoplastics decision was made by Shell Chemical

Read about this Shell decision. And how you can start benefiting today from a major new source of polystyrene, polypropylene and polyethylene that resulted from it.

On MAY 3, 1960, Shell Chemical, a company long basic in styrene monomer and SBR rubber, decided to combine the two in full commercial production of Shell high impact polystyrene. Why was this remarkable?

A revealing fact on polystyrene

The condition of the polystyrene market was not attractive. There was oversupply from some of America's finest companies. The field was mature and Shell was starting late.

One revealing fact offset this situation. *Shell, with its excellent background in polymer chemistry—as exemplified by Shell Isoprene Rubber, the industry's first commercially produced synthetic/natural rubber—could make positive contributions to the thermoplastics field in the form of new products.* But Shell would be severely handicapped without a thorough understanding of how the thermoplastics market works and what it wants.

Result? Shell's decision to go full speed ahead with high quality general purpose, medium and high impact Shell polystyrenes, plus a rapidly expanding technical sales force.

80 million pounds of polypropylene

Two other thermoplastic developments followed quickly.

One, Shell's announcement in October, 1960, for an 80 million pounds a year polypropylene plant with customer service and research facilities to be built near Woodbury, N. J. Two, an arrangement by which Shell will resell limited quantities of polypropylene until this plant comes on stream.

Custom-made polyethylene

And this, in turn, led to a third important thermoplastic.

In order to round out a complete line of thermoplastics, Shell Chemical, in January, 1961, made arrangements to supply the industry with the highest quality custom-made polyethylenes.

How to start benefiting

Thus, within 8 months, Shell became an important factor in three plastics: Shell polystyrene, Shell polypropylene and Shell polyethylene.

The next 8 months should be even more important. Shell will be going full speed ahead searching for new polymers you want.

Now is the time to let Shell's technical representative know your needs. Tell him about them on his next visit or write Shell Chemical directly at:

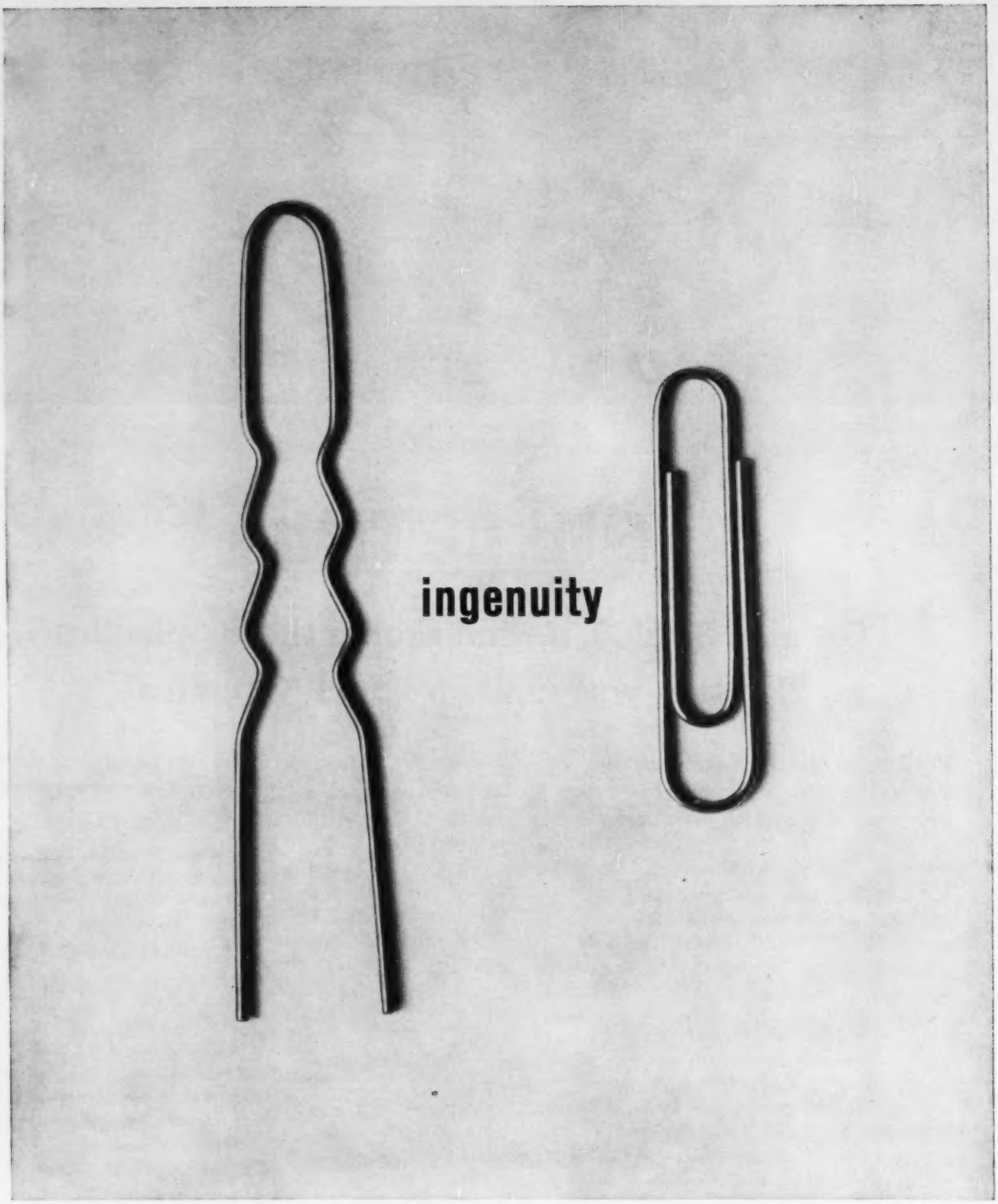
42-76 Main St., Flushing 55, N.Y. FLushing 3-4200; 20575 Center Ridge Rd., Cleveland 16, O. EDison 3-1400; 6054 West Touhy Ave., Chicago 48, Ill. SPring 4-6711; or 10642 Downey Ave., Downey, Calif. SPruce 3-0601.

A Bulletin from

Shell Chemical Company

SHELL

Plastics and Resins Division



The measure of man's resourcefulness is limited only by his imagination . . . or so it seems in today's fast moving world, particularly in the exciting field of organic chemistry. Along these lines we have developed a highly reactive group of aliphatic polyfunctional molecules that can do more than trigger the imagination. You'll find concrete applications in any number of end products . . . perhaps the one you are working on now. Literature and samples available upon request.

KAY-FRIES CHEMICALS, INC., 180 MADISON AVE., NEW YORK 16, N. Y.

*Barbituric Acid • Cyanoacetic Acid • Cyanoacetamide • Methyl and Ethyl Cyanoacetate • Malonic Acid • Diethyl Malonate Dichloroacetic Acid • Methyl Dichloroacetate • Malonaldehyde Diacetal • Malononitrile • Methyl Chloroacetate • Methyl and Ethyl Orthoformate • o-Hydroxyacetophenone • Ethyl Lactate • Ethyl Chloroacetate • Diethyl Ethoxymethylene Malonate • Sodium Formaldehyde Bisulfite.

Monsanto's Steber and Cassidy: Trying to keep up with production.

Betting On Better Handling

An efficient new centralized blending and packaging plant will give Monsanto's Organic Chemicals Division more leverage in the highly competitive organic liquids market.

The unit cost more than $1 million, will automatically blend, store and package nearly 80% of the 700 million lb./year organic liquids output of Monsanto's John F. Queeny plant (St. Louis).

It was tailored specifically for several families of organic liquids (principally plasticizers, resin intermediates, petroleum additives and functional fluids). Over 260 different products in these four categories will be handled by the new facility.

Unbalanced Growth: The start-up last week capped a two-year effort by Richard F. Cassidy, (*above, right*) general superintendent of the Queeny plant and Leonard Steber, packaging and materials handling engineer assigned to the project. Their aim was to straighten out a badly outdated and disorganized liquids handling operation that sprawled over a huge plant area.

At the time Monsanto moved to revamp its operation in '59, liquids storage, blending and packaging operations covered some 60 acres of riverfront St. Louis. Symptomatic of the inefficiency and lack of coordination at that time was the fact that packaging operations were sometimes conducted simultaneously in eight widely scattered spots. Many of the operations were done manually and alleys and walkways were often crowded with drums—both empty and full. This clutter posed safety hazards, slowed the whole operation, sometimes left too little room to load tank cars and trucks.

The cause? Unbalanced growth. While manufacturing operations had expanded rapidly to meet growing demand for the firm's organics, distribution facilities had simply not kept pace.

By the late '50s, heavy competitive pressures and burgeoning demand for small-order shipments forced Monsanto to take a second look at its outmoded handling plant. In Cassidy's words, "We were starving for quality and service here."

Success Formula: Steber and Cassidy based their renovation plan on three fundamental objectives:

(1) Efficiency and flexibility. They aimed for reduced handling costs based on faster, more flexible operations within a smaller area.

(2) Product Improvements. Both Steber and Cassidy agreed that the new facility should have the latest handling equipment and procedures to improve quality control. Both have first-hand experience of the importance of proper handling to product cleanliness and uniformity.

(3) Improved Customer Services. The division had to be able to supply customers with containers of virtually any size on an almost immediate basis.

With these objectives in mind, Steber laid out the new system. It provides substantially greater — and more efficient — liquid-handling capacity by concentrating operations within a much smaller area, has greater bulk-liquid storage capacity, and faster filling and blending capabilities for all kinds of containers. A modern intraplant communications system speeds order receipt and handling.

How It Works: Monsanto's new bulk-liquid handling operation is now completely separate from production facilities, and many small operations

have been consolidated on much less land area—2 acres vs. the former 60 acres.

Production batches are piped into greatly expanded bulk-liquid storage facilities — just under 700,000 gals. The nine 50,000-gal. and eight 30,000-gal. tanks are equipped with insulation and heater assemblies so that highly viscous materials can be handled easily. Liquids stored in these tanks are continuously circulated through outside filters to maintain product uniformity within close tolerances.

The tanks are built so they can be washed or blown clean to receive new products in short order.

Surer Blending: Steber designed an elaborate blending system for plasticizers and for resin intermediates. Seventeen pipelines carry products from the huge storage facilities to the second floor of the blending building, where they terminate in a huge semicircular "switch station" near two 4,000-gal. weigh tanks. These lines are hooked up to the tanks manually —to avoid costly blending errors or valve leakage contamination—and the tank scales print the net weight of each component as it is added to the blend.

Although some additives are now being blended manually, the company plans to automate this operation. And, a drum-warmer oven will be added soon to aid in blending the viscous materials.

Automatic Drum Handling: Besides bringing its drums in off the streets, Monsanto has completely automated their handling. A supply of 200 drums is stored near the blending room roof (in what was formerly unused air space) on a powerized conveyer with several lines. (Although 200 drums do not represent an extensive supply, they are backed up by one-hour drum deliveries from Monsanto suppliers.)

All the other drum-handling operations—recovery from storage, taring (weighing empty), filling with product, closing with high-speed overhead tools, and palletizing, are also done automatically.

Rapid Fill: Monsanto's new high-speed package-filling equipment works at five times the rates obtainable with the former low-performance process pumps. It now takes just 30 seconds to fill a 55-gal. drum, 15 min. for a tank truck; 30 min. for a tank car.

And once the containers come off the filling and closing line, those that are needed for immediate delivery can be put directly onto waiting trucks or railroad cars. The others can be stored in a 22,000 sq.-ft. storage area adjacent to the closing operation where—Monsanto found—it can stack palletized drums five high, rather than four high, without fear of breakdown. Secret of the drum tower: nearly perfect alignment of drums that come from the automatic palletizer.

Speedy Communications: One of the most important customer-service features of the new packaging-blending unit is its fast response to orders. A teletype machine is hooked into the company's central order department, picks off all organic fluids orders and thus bypasses a 2½-hour paperwork delay.

At the same time, shipping labels typed at the central order department are printed at the drumming site by remote control in any quantity needed. Monsanto also hopes to equip the blending-packaging center foreman with a small transistorized transceiver (walkie-talkie) with which to keep the order processing and inventory control departments posted on stock levels.

Object Lesson: Although Monsanto has geared its new liquids packaging and handling operation to the needs of the organic markets—where such innovations are relatively uncommon —it seems clear that many other chemical processors and resellers may benefit from some of the improvements the company has made.

And Monsanto itself is hopeful that many of the same liquids handling innovations will contribute to efficiencies in its raw materials handling operations. Modifications here are scheduled for late this summer.

Although Monsanto figures its new liquids handling operation will help cut its over-all packaging and distribution costs, it does not now foresee any price reductions based on such savings. And, while it is too early to tell just how the new venture will work out, it is clear that Monsanto is counting on its ability to render fast, flexible and efficient customer service to give it new support in its bid for a larger chunk of fast-growing organic liquids markets.

Hopeful Credit Signs

The first glimmers of hope for chemical credit managers came last week from the latest quarterly survey conducted by the National Assn. of Credit Management's Credit Research Foundation.

In its latest report on the chemical industry credit situation, CRF notes improvement in two prime indicators of credit health—accounts receivable on a current basis, and accounts overdue by more than 90 days.

The CRF survey shows that the proportion of chemical industry customer accounts now paying within normal (30 day) terms had risen to 81.3% by April 1, compared with 77.4% in January. And the proportion of long overdue accounts has dipped to 3.0% in April from January's 3.8%.

What's more, several chemical industry speakers at the recent NACM Credit Congress in Denver, Colo., noted improvement in their respective companies' credit positions. Olin Mathieson's Eugene Hughes for one, reported that his firm's collections during the first four months of '61 are "considerably above the volume of a year earlier."

Mixed Reactions: But not all the credit news is good. CRF found, for example, that the average number of days' sales outstanding (a measure of sales not yet paid for) has moved upward to 37.5 from January's 35.8 figure. CRF's assistant director of research John Neary points out that this is very likely due to extended dating (take now, pay later) arrangements that are commonly used by agricultural chemicals marketers.

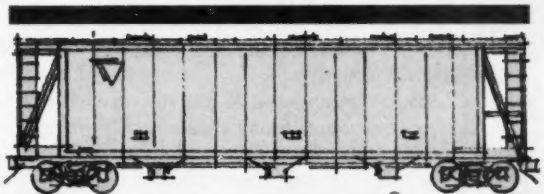
However, several of the CPI's traditional credit "soft spots" are providing plenty of trouble for credit men. Among them: plastics processors, particularly the makers of blow-molded toys.

Another trouble spot that seems to be worsening is the overseas area. Here, stiff competition from zealous overseas chemical producers (particularly German, French and Japanese firms), who think nothing of granting up to six months' credit, is giving U.S. credit managers new worries.

All told, credit men are pleased with the improvement signs evident so far, but they are awaiting a more substantial summer upturn.

18 MAJOR CHEMICAL COMPANIES

NOW SHIP RESINS IN THE NEW



DRY-FLO CHEM® CAR

General American designed its new DRY-FLO CHEM Car to protect plastic resins from contamination and moisture pickup. It is being used by 18 of the major producers of polyethylene, polystyrene and polypropylene. The unique feature which makes this car better than any other for bulk transportation of contamination-sensitive, free-flowing solids is General American's patented nozzle for pneumatic unloading.

The DRY-FLO CHEM car is built with three separate compartments, each with its own nozzles and hatches. Exterior carlines—pioneered by General American—provide a smooth unbroken ceiling surface and hopper corners rounded on a 2½" radius minimize product retention inside the car.

Write for details.

Airslide® and Dry-Flo® Car Division

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street • Chicago 3, Illinois *Offices in principal cities*

DRY-FLO GENERAL AMERICAN TRADE MARK

WIDE WORLD

Schering's Leitzow (left), FTC's Dixon discussed trade practices.

Split Over Trade Practice

A wholesale assault by the Federal Government on the idea of "price leadership"—not just on price collusion or identical pricing—was predicted last week by H. Graham Morison, former head of the Antitrust Division of the Justice Dept.

Morison, now in private law practice in Washington, made his prediction at a three-day briefing session for businessmen on the role and influence of federal regulatory agencies in marketing. The meeting in New York was sponsored by the American Management Assn.

His prognostication was just one of several unsettling comments from nearly a dozen representatives of federal agencies—including taped remarks by Attorney General Robert Kennedy, Senator Estes Kefauver and Federal Trade Commission chairman Paul R. Dixon.

Their debate—and it was just that—ranged over a broad sweep of marketing subjects currently in the public spotlight. Among them: truthfulness and taste in advertising, industry trade practice rules, prices and price-fixing, tighter regulation of the drug industry and salesmen's expense accounts.

Tighter Federal Grip? Morison also predicted that the Kennedy Administration would seek to enlarge its powers in investigating pricing complaints—either by broader interpretation of present laws, or by new laws. And, Morison flatly said that if prices are going to be "decided" (rather than set by competitive conditions), the decisions will be made by the Federal Government—not by a few executives in certain "key" industries.

Some of the businessmen at the meeting voiced their opposition to much of what they heard from the government leaders. None was more vocal than Herman Leitzow, voluble marketing vice-president for Schering Corp. Leitzow followed Sen. Kefauver on the program (Kefauver's talk was on tape) and criticized practically everything the Senator had to say.

Kefauver's most startling announcement was his proposal to make corporation officers and board members criminally liable for antitrust violations by their firm's employees.

Trade Practices: Paul R. Dixon, and several associates from the FTC stressed their new militancy, pointing out that "we'll protect the consumer with a squad car, not a hearse." However, the FTC men reemphasized their hope that voluntary compliance would become more effective.

Throughout the discussions, the chemical process industries were involved intimately—in the debate over truth in advertising (shaving creams, dentifrices, etc.) and in the discussion on tighter drug industry regulations.

Although the meetings didn't turn up many startlingly new ideas, they did add substance to the increasingly uneasy feeling of many businessmen that there will be closer federal supervision and control in marketing.

New from Du Pont: Protective Finishes Formulated Specifically to Combat Severe Corrosive Conditions

(T.M.)

IMLAR

Vinylmastic Coatings and Vinyl Enamels

Du Pont announces a new line of chemical-resistant coatings to help you hold down spiralling maintenance costs by providing dependable, long-term protection under corrosive conditions that cause ordinary maintenance paints to fail rapidly.

Ideal for Severe Acid Conditions

IMLAR Vinylmastic Coatings and Vinyl Enamels possess extraordinary resistance to spillage, fumes and vapors from highly corrosive acids and alkalies—including sulfuric and nitric acid, sodium chloride, ammonia and lime. They also withstand persistent condensate, water immersion and salt spray, have excellent resistance to radiation decontaminating solutions, are unaffected by surface temperatures up to 150° F.

For Indoor or Outdoor Applications

Ready-mixed IMLAR coatings are recommended for field or maintenance painting of any steel or concrete surface subject to highly corrosive conditions. They can be used indoors as well as out, on buildings, structural steel, heavy machinery, bins, hoppers, tank or vat interiors and exteriors. Applied in three stages—primer, intermediate and topcoat—they dry quickly to a thick, hard, semi-gloss finish with excellent cohesion and flexibility, superior distensibility and abrasion resistance.

Relatively non-toxic, IMLAR coatings are easy to apply with conventional spraying equipment. Proper surface preparation (preferably sandblasting) is a must. Topcoats come in red or gray as well as black and white. Typical industrial applications for IMLAR include bleacheries, paper mills, chemical and petroleum plants.

For areas with severe alkali conditions, use new Du Pont CORLAR(T.M.) Epoxy Chemical-Resistant Finishes. They offer excellent resistance to chemical fumes, spills and moisture.

For recommendations concerning your own specific corrosion problems, get the expert advice of your local Du Pont Technical Representative. To reach him, call your nearest Du Pont District Sales Office, listed in your phone book. For more detailed information about these new finishes, clip and mail the coupon below.

Clip and Mail the Coupon Today for FREE Du Pont Technical Bulletin!

E. I. du Pont de Nemours & Co. (Inc.)
Finishes Division, Department CW-16
Wilmington 98, Delaware

Please send me, without obligation:

☐ The Du Pont Technical Bulletin, "IMLAR Vinyl Coatings."

☐ The Du Pont Technical Bulletin, "CORLAR Epoxy Chemical-Resistant Finishes."

Name _____

Firm _____

Street _____

City _____ Zone ____ State _____

DU PONT
REG. U.S. PAT. OFF.

IMLAR (T.M.)
Chemical-Resistant Coatings

Better Things for Better Living . . . *through Chemistry*

Canadian Road Rules

U.S. chemical producers doing business in Canada may soon be faced with a new set of highway safety regulations in Ontario Province.

According to Transport Minister Leslie Rountree, the Ontario Government expects to publish within six months extensive safety regulations reflecting the government's concern over the frequency of recent highway accidents involving trucks loaded with hazardous chemical products. Investigations of the specific proposals are still in progress.

New Course: The new rules will probably cover five categories of hazardous materials: flammable liquids, acids, corrosive liquids, compressed gases and gasoline. The government has not yet explained why it chose these categories, but it says that explosives are omitted because they are covered in Canada's federal road safety regulations.

Until the new rules are approved, Ontario will continue to operate under Canada's federal road rules, patterned after this country's Interstate Commerce Commission highway regulations.

The new rules are expected to require all vehicles hauling hazardous materials to carry large placards identifying the materials hauled and describing procedures for emergencies. They may also limit the quantities of dangerous materials that can be carried at any one time.

DATA DIGEST

• **TMB:** New bulletin (CT-520) lists properties, uses and handling of trimethoxyboroxine. Typical uses: metals fire extinguisher, primary curing agent for epoxy resins, and nitrogen removal agent for refinery feedstocks. Callery Chemical Co. (Callery, Pa.).

• **Formamide:** Product information bulletin describes chemistry and properties of formamide as an intermediate, solvent and delayed gel-producing reactant. E.I. du Pont de Nemours & Co., Inc. (4147 DuPont Bldg., Wilmington 98, Del.).

• **Hydrogen Peroxide:** Two safety data-sheet supplements detail physical properties, bulk-handling procedures, transportation, storage and use of hydrogen peroxide. Supplement SD-53-A (30¢) covers solutions not exceeding 52% concentration by weight. Supplement SD-53-B (50¢) describes high - strength hydrogen peroxide (above 52% concentration). Manufacturing Chemists' Assn. (1825 Connecticut Ave., N.W., Washington 9, D.C.).

• **Ketone Catalyst:** Technical publication outlines properties of a ketone peroxide catalyst for polyester resin curing. Lucidol Division, Wallace & Tiernan Inc. (1740 Military Rd., Buffalo 5, N.Y.).

• **Stabilizer:** Data sheet outlines physical properties and applications of a liquid barium-cadmium-zinc heat and light stabilizer for plastisols. Advance Division, Carlisle Chemical Works, Inc. (New Brunswick, N.J.).

• **Organic Solvents:** Chart provides comparison of physical properties of more than 200 commercially available common organic solvents. It includes general definitions of the terminology used. Central Solvents & Chemicals Co. (2540 West Flournoy St., Chicago 12).

• **Coatings:** Four-page folder describes 18 special industrial coatings, including physical characteristics and applications. Service Products Division, Johnson's Wax (Racine, Wis.).

• **Emulsifiers:** New laboratory bulletin lists Continental Chemical Co.'s (195 21st Ave., Paterson, N.J.) line of alkyl sulfates, alkyl aryl sulfonates, alkanolamides and other specialized emulsifiers.

• **Extruded Sheets:** Technical bulletin outlines properties and extrusion conditions for high-density polyethylenes and ethylene copolymers. Phillips Chemical Co. (80 Broadway, Suite 4300, New York 5.).

• **Silicones:** New, eight-page catalog (CDS-129C) outlines properties and uses for four categories of silicones: fluids, protective coatings, electrical insulation and rubber. A new feature is the grouping of product types under end-use headings. Silicone Products Dept., General Electric (Waterford, N.Y.).

• **Ion Exchangers:** Company periodicals (62 and 63) discuss liquid amine anion exchangers, suggesting their use in continuous countercurrent ion-exchange systems for hydrometallurgical separations, waste treatment, product purification and separations typical of pharmaceutical and food processing industries. Rohm & Haas Co. (Washington Sq., Philadelphia 5.)

It sells better if it smells better

One of the subtlest, yet most powerful influences on the sales appeal of a product is its odor. Rhodia Inc. gives your products maximum salability by: (1) neutralizing unpleasant odors and/or (2) the addition of an appropriate fragrance. Why not call on Rhodia soon?

Rhodia

Rhodia Inc., 60 E. 56 St., N. Y. 22, N. Y. • PLaza 3-4850.

AMMONIUM NITRATE

C&I

new prilling process

C&I ammonium nitrate plants equipped with prill towers approximately ⅓ the size of conventional towers produce a superior prilled ammonium nitrate fertilizer from an almost anhydrous melt. Because of its physical characteristics, this product can be stored and shipped in bulk. These plants can also be designed to produce any of the nitrogen solutions offered on the market today.

THE CHEMICAL AND INDUSTRIAL CORP.

CINCINNATI 26, OHIO

For more information on this proven C&I process, write today for a new brochure which contains comprehensive data and flow sheets.

Market Newsletter

CHEMICAL WEEK
June 10, 1961

Chemical pricing practices take the spotlight this week. And in some cases—nitrogenous fertilizer materials, for example—even Sen. Kefauver would be happy over the variety of schedules various major producers may soon post.

The ragged pricing situation in fertilizers was kicked off when Allied Chemical served notice on the trade that it would not inaugurate traditional seasonal discounts on its products (including urea, anhydrous ammonia, solutions, etc.) with the start of the new fertilizer year, July 1.

There is a good deal of disagreement in the industry over Allied's contention that "off-season" reductions aren't much help in leveling out demand over the entire year. The company has tried to wipe out the non-season buying inducements in the past (*CW Market Newsletters, June 21; June 28, '58*), but invariably was forced to backtrack when other makers wouldn't go along.

At present, most fertilizer producers have not decided whether to follow Allied's suit. This, despite a strong feeling in the trade that now may not be the time for a break with traditional discounting practices. Fertilizer demand is expected to accelerate, but business hasn't been too brisk of late because of rainy weather in many parts of the country.

•

The current situation in urea is not contributing much to a clarification of the nitrogen market. In the face of Allied's present intention to maintain listings, W. R. Grace says it will raise its urea prices $2-3/ton as of July 1—and, as in the past, makes no provision for discounts.

New Grace prices peg fertilizer grade urea at $98/ton in bags, and $92/ton in bulk quantities. Feed-grade (42%) will sell for $103/-ton (bags), $99/ton (bulk); and 46% industrial grade urea will be bag-tagged at $110.50/ton. Along with the increases, Grace will switch from an f.o.b., to a delivered pricing system on urea produced at its Memphis, Tenn. plant.

On the other hand, although Spencer Chemical also intends to raise urea prices, its new schedules will include seasonal discounts, go into effect Aug. 1. Bagged 45% fertilizer-grade urea, for instance, will carry these f.o.b. listings: Aug. 1 through Sept. '61, $87.25/ton; Oct., Nov., and Dec., $91.25; Jan. '62 forward, $95.25/ton.

Delivered prices, reflecting the discounts, will be $3.50/ton higher than the above quotes. (Spencer's ammonium nitrate, anhydrous ammonia, nitrogen solutions, will all carry seasonal discount rates).

In addition, the company will depart somewhat from a pattern of the past; for the first time it will make urea prices comparable with ammonium nitrate on a per-unit-of nitrogen basis.

Where does all this leave other major urea sellers? A spot, cross-country check reveals that most are wrestling with a pricing decision right now. Says one observer facetiously: If a uniform, industry-wide urea price emerges this year—"it'll be strictly coincidental."

•

No such confusion exists in the potash segment of the fertilizer industry.

Last month the trade learned that domestic agricultural prices would go up July 1. Last week, a major N.Y. potash importer (French Potash & Import Co., Inc.) indicated that foreign potash material hitting the U.S. market will also be advanced on that date. New prices will be in keeping with upcoming domestic schedules.

The increases will lift imported muriate potash $1.20/ton over last season's price. Semi-coarse and coarse muriate will be higher by $1.85/ton and $2.40/ton, respectively.

•

By now, prices of most high-density polyethylene are 3-5¢/lb. lower than they were last week. Industry reaction to the Hercules-initiated cuts (which followed by a few days the company's introduction of a low-cost, "stiffer" resin), was not quite instantaneous, but fast enough to give the impression that others might have been contemplating such a move.

Officially Hercules says that its reduction was inspired by volume production coming in at its Parlin, N. J., plant. The firm's new resin (0.962 density), is priced at 32¢/lb., will be aimed first at the one-gallon, rigid thin-wall container market (for bleach, other household products). Hercules' established Hi-Fax (0.945 density) was cut 3¢/lb., to 35¢.

The Hercules reduction was only a starting point for, among others, W. R. Grace's Polymer Chemicals Division. That company ripped through its high-density polyethylene price list, chopped prices of resins going into blow molding, injection molding, wire and cable insulation, monofilaments, film and sheet, and flame-retardant compounds. The last-named, for example, was reduced from 48¢/lb. to 43¢, and a wide series of injection and blow-molding grades have been priced at 32¢/lb.

•

The tall oil rosin market, generally, has come down to the 11.15¢/lb. level posted by Arizona Chemical last month, after the April reduction to 12.15¢. There's a fair chance the material may hold at the new level through the rest of the year, but this depends on the track competitive gum rosin takes.

Recently, the powerful gum rosin co-op, the American Turpentine Farmers Ass'n., said it hoped to maintain gum prices at 12-14¢/lb. (f.o.b. southern shipping points), but as of now some grades (WW, WG), are quoted at 11.6-12.32¢/lb. A continuation of the downtrend could exert further pressure on tall oil rosin tags.

PURCHASING AGENTS
PRODUCTION SUPERVISORS
RESEARCH CHEMISTS

NEW
CONVENIENT
COMPLETE

CATALOG OF OUR CHEMICALS

Pharmaceuticals • Organic Intermediates • Specialties

...62 pages of carefully screened facts and selected technical data on Benzol Products Company chemicals... at your disposal. You cannot afford to be without this convenient catalog for reference.

Our product line reflects the highest standards of quality... We are accustomed to making our products only that way!

ALKYL BROMIDES
AROMATIC CHEMICALS

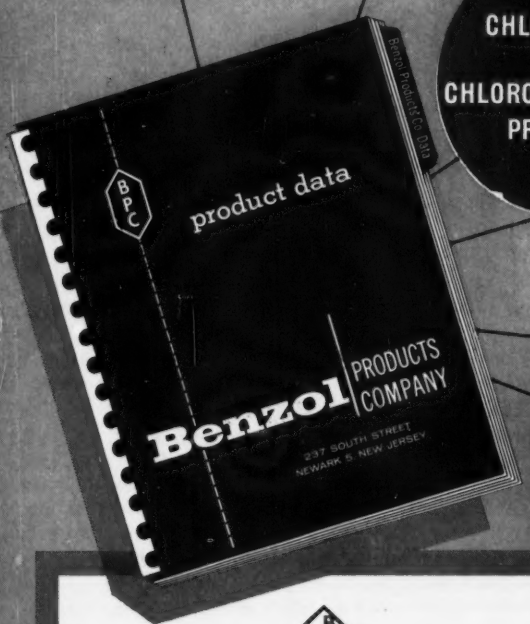
BARBITURATES
MALONIC ESTERS

CHLORINATED and CHLOROMETHYLATED PRODUCTS

ORGANIC INTERMEDIATES
PRECURSORS

RESEARCH CHEMICALS

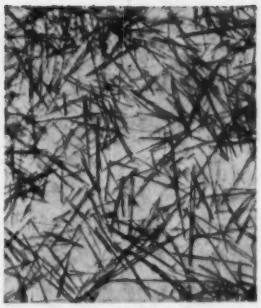
PHARMACEUTICALS (bulk)
CUSTOM SPECIALTIES



Benzol PRODUCTS COMPANY
237 SOUTH STREET
NEWARK 5, NEW JERSEY

Manufacturers of Fine Chemicals

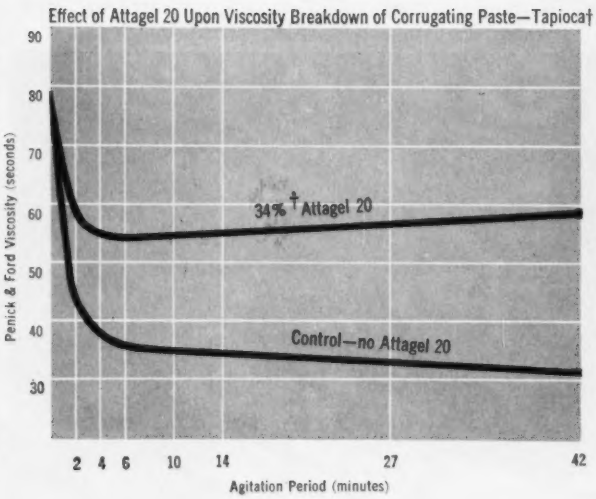
Request this "Product Data" catalog on your company letterhead ...TODAY.



Pattern for a better product

At 35,000 magnification, the needle-like structure of attapulgite indicates those physical characteristics that make it applicable for many uses — high surface area, colloidal state, high adsorptivity, low bulk density. Well worth looking into for your product — use the coupon.

MCP PROCESS MATERIALS



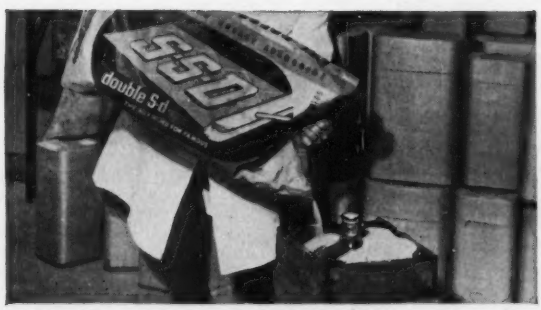
†Based on starch solids in the carrier portion of the paste.

Starch Adhesive viscosity stabilized with Attagel 30

A basic characteristic of starch corrugating adhesives is their loss in viscosity during use. This occurs as the result of shearing forces applied to the pastes during recirculation and at the corrugator application roll, and forces frequent adjustment of glue-roll clearance. Waste and inefficiency of the adhesive are also a result.

Attagel 30, a colloidal grade of processed attapulgite, forms stable gels on application of shear. When used in a corrugating paste, it will *increase* in viscosity under the same shearing forces that *decrease* the viscosity of the starch, thus offsetting the viscosity loss, and stabilizing the total system within narrow limits.

Non-toxic, highly sorptive, and chemically inert, Attagel 30 may be an answer to your viscosity problem — check the coupon for data.



Versatile Absorbent is useful chemical and general industry aid

Safety and cleanliness records are hitting a new high in plants where a versatile mineral adsorbent is currently finding many uses. Highly sorptive, and chemically inert, Sol-Speedi-Dri, is excellent for use as packing around containers that may leak or break, as well as for use wherever a hazard exists on floors because of oil, water, acids, alkalies, or other liquids.

An efficient housekeeping aid, Sol-Speedi-Dri is inexpensive, non-burning, and very effective. For a list of 101 industrial uses, send the coupon.

MINERALS & CHEMICALS PHILIPP CORP.
8746 Essex Turnpike, Menlo Park, N. J.

I am interested in:

☐ Edgar Paper Clays ☐ Attagel 30
☐ Attapulgus Clay Products ☐ Sol-Speedi-Dri Adsorbent

Please send without obligation:

☐ data ☐ samples ☐ prices ☐ technical representative

Name _____
Title _____
Company _____
Address _____
City _____ Zone _____ State _____

Use this quick two-check coupon . . .

✔ for your product interest
✔ for what you need to get tests started

we'll fill your requests immediately

For more data, see your 1961 Chemical Materials Catalogue, pages 423-430

CORPORATION

Hooker...prime source for better phosphates

Hooker, with plants at three locations, can provide ample supplies of phosphates. These products are of high purity and are available in both bulk and in bags. Typical of Hooker quality is our sodium tripolyphosphate, 98% pure—highest in the industry.

As a prime producer of sodium tripolyphosphate, tetrasodium pyrophosphate, trisodium phosphate and tetrapotassium pyrophosphate, Hooker is in a unique position to meet the needs of soap and detergent manufacturers anywhere in the country.

ADVANTAGES OF HOOKER PHOSPHATE GRANULES
No matter how you compound your own product, you'll find it advantageous to use Hooker phosphates. If your product is prepared as a slurry and then spray-dried in your own tower, you get the advantage of faster dissolving without lengthy agitation.

CLEARER SOLUTIONS. Where color is important, Hooker's virtually haze-free phosphates meet exacting requirements.

DUST FREE. Hooker's sodium tripolyphosphate and tetrasodium pyrophosphate are freer from dust because they are spray-dried into hollow, ball-like particles. There are no sharp edges to break or crumble. Your own workmen and those of your customers will be spared the annoyance of phosphate dust. Also available in regular density, as are sodium hexametaphosphate and trisodium phosphate.

NO PREMIUM PRICE FOR PREMIUM QUALITY
To check on our premium quality, ask for samples. To check our prices, ask for price sheets.

HOOKER CHEMICAL CORPORATION

PHOSPHORUS DIVISION, BOX 326, DEPT. CW-6, JEFFERSONVILLE, INDIANA
SALES OFFICES: CHICAGO, ILLINOIS • NEW YORK, N. Y.

HOOKER CHEMICALS PLASTICS

Saving Money on Corporate Weddings

Last week, Diamond Alkali confirmed that its planned mergers—with Chemical Process Co. and with Bessemer Limestone & Cement — (CW Business Newsletter, May 27) will be accomplished by the increasingly popular technique called "pooling of interests."

Pooling of interests, an accounting term for a distinct method of acquisition that differs from an outright purchase, has recently gained strong favor in the CPI (*see table, right*). Reason: It is not only a comparatively smooth way of integrating operations, but also affords certain benefits over direct purchase.

There are, of course, some definite rules that must be followed before the watchdogs of U.S. corporate behavior—the Treasury Dept., the Securities and Exchange Commission, the New York Stock Exchange—will consider an acquisition as pooling of interests. Diamond's steps in acquiring CP and Bessemer clarify some of them:

There must be no plan to make significant management changes (maintaining the "continuity of the acquired firm"), and the acquisitions will be made by an exchange of stock—a move that shows Diamond unlikely to violate another pooling "taboo": a business shouldn't be abandoned or sold.

What's the Difference? The committee on Accounting Procedure, American Institute of Certified Public Accountants (New York) reflects these views of SEC and NYSE. It distinguishes between a "purchase" and a "pooling of interests" in the "attendant circumstances" rather than in the legal designation of the transaction (e.g., merger, consolidation, exchange of shares, etc.).

Pooling of interests is described as "a business combination of two or more corporations in which the holders of substantially all of the ownership interests (usually common stock) in the constituent corporations become the owners of a single corporation which owns the assets and businesses of the constituent corporations, either directly or through one or more subsidiaries, and in which certain other factors are present."

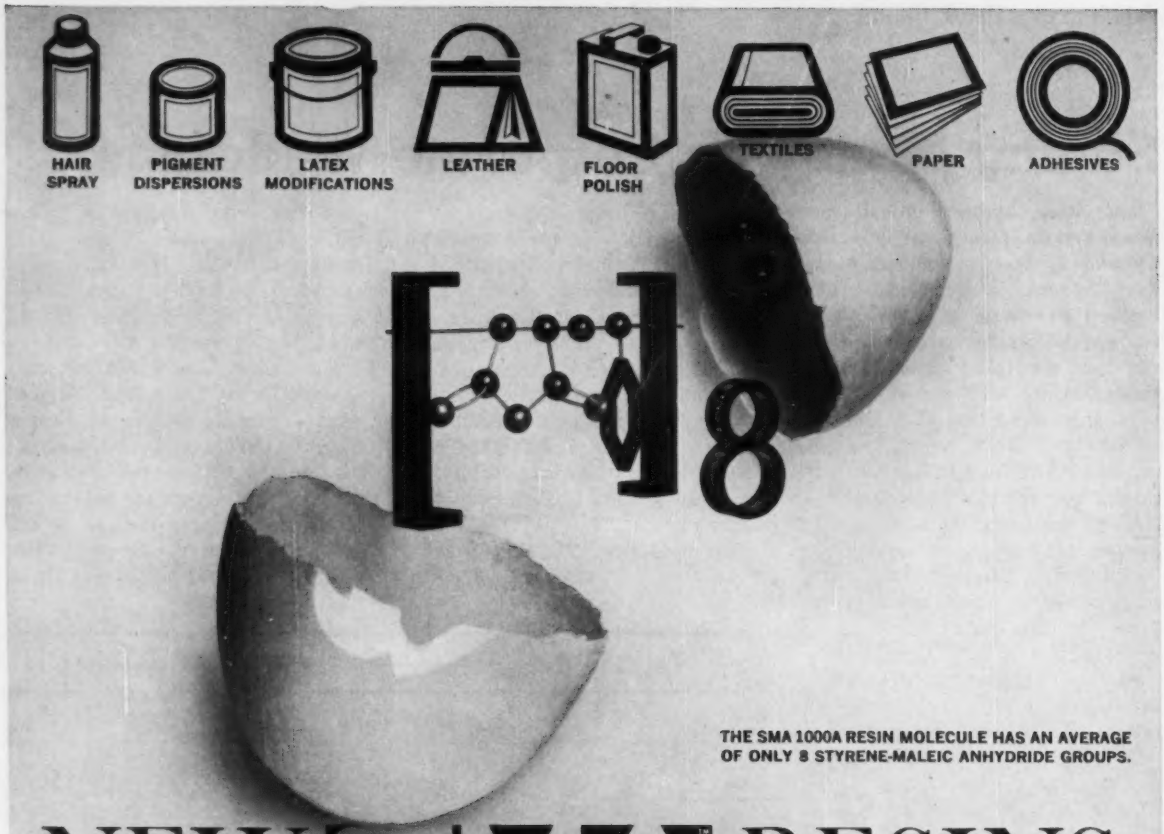
A "purchase" is defined somewhat in terms of pooling; it is described as "a business combination of two or more corporations in which an important part of the ownership interests in the acquired corporation or corporations is eliminated or in which other factors requisite to a pooling of interests are not present." (Details of these factors appear in bulletin No. 48 issued by the accountants' committee.)

The important difference between a purchase and a pooling, for tax purposes, is the handling of "goodwill"—an item that can amount to millions of dollars. If a company is purchased, goodwill (e.g., trademarks) may be treated as an item different from tangible assets.

For example, company A purchases company B for $10 million. Physical plant — reactors, warehouses — represent $5 million of B's cost, goodwill the other $5 million. Tax laws allow the cost of the plant ($5 million) to be depreciated over the life of the plant. So A gets the benefit of this expense before income taxes. That's

Typical Expansions via Pooling of Interests in '60

Company	*Acquisition*	*Details*
Colgate-Palmolive	**Lakeside Laboratories**	Assets and business of Lakeside exchanged for 369,448 shares of C-P common stock.
W. R. Grace	**Hatco Chemical**	A retroactive pooling. In '60, Grace reconsidered its purchase of Hatco in '59 for 126,000 shares of Grace common stock, decided to treat it as a pooling of interests. A goodwill item of $3,880,321 was thereby eliminated.
Hercules Powder	**Imperial Color Chemical & Paper**	Net assets of Imperial exchanged for 509,802 shares of Hercules $2 cumulative convertible class A stock.
Monsanto	**Chemstrand**	Exchange of 3,540,000 shares of Monsanto common stock for the entire investment of American Viscose in Chemstrand.
Reichhold Chemicals	**Alsynite Co. of America; Deecy Products Co.**	Reichhold issued shares of its common stock in exchange for the net assets of Alsynite and all outstanding shares of Deecy.
Wallace & Tiernan	**R. J. Strasenburgh Co.**	Former stockholders of R. J. Strasenburgh were issued 800,000 shares of Wallace & Tiernan common stock (after a 2 for 1 stock split).



THE SMA 1000A RESIN MOLECULE HAS AN AVERAGE OF ONLY 8 STYRENE-MALEIC ANHYDRIDE GROUPS.

NEW SMA RESINS:
KEY TO PRODUCT IMPROVEMENT

Evaluate these newly-created *low molecular weight* styrene-maleic anhydride copolymers. Their short chain length (molecular weight approximately 1600), polyanhydride structure, alkali solubility, and surface active properties can be your key to new or improved products. A few potential application areas for SMA resins include use as a **chemical intermediate** utilizing reactive anhydride groups; **latex modification** (of commercially available latexes) to alter their performance in the paint, textile, leather and paper industries; as **protective colloids** in emulsion polymerizations to achieve improved properties; as **dispersants** for hydrophobic pigments to achieve high solids, low viscosity dispersions; as a partial or complete **replacement for shellac** in emulsion floor polishes and in other shellac applications. Perhaps these potential applications suggest to you other uses for SMA resins, now available in semi-commercial quantities. Samples and data are now available from TB&C. Please request on your company letterhead.

TEXAS BUTADIENE & CHEMICAL CORPORATION

Polychemicals Department, 529 Fifth Avenue, New York 17, New York.

TB&C also produces: Butadiene, Butene-1, Butene-2, Mixed Butylenes, Propylene, Alkylate, Avgas.

not the case with the $5 million A has spent for goodwill. The $5 million may be carried on A's balance sheet year after year. Or it may be amortized by A—say over 10 years at $500,000 a year. Although the $500,000 is deducted from earnings each year, income tax must be paid on earnings *before* the deduction.

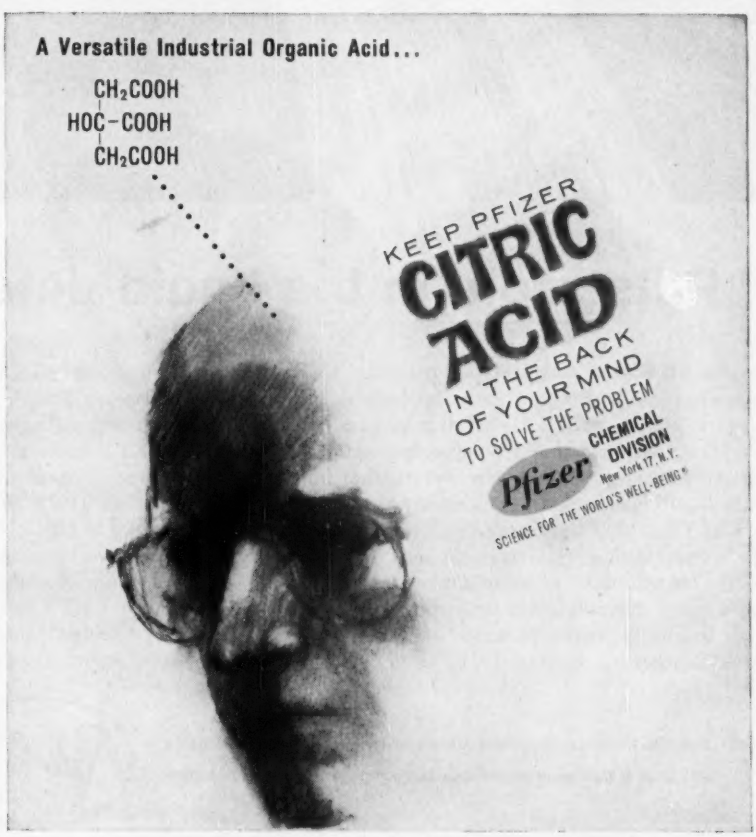
When an acquisition is made by pooling interests, on the other hand, goodwill is not considered as a separate item. Balance sheets of the blended companies are consolidated. The new balance sheet shows combined assets, retained earnings, capital stock and the like. And new financial reports reflect combined sales and earnings.

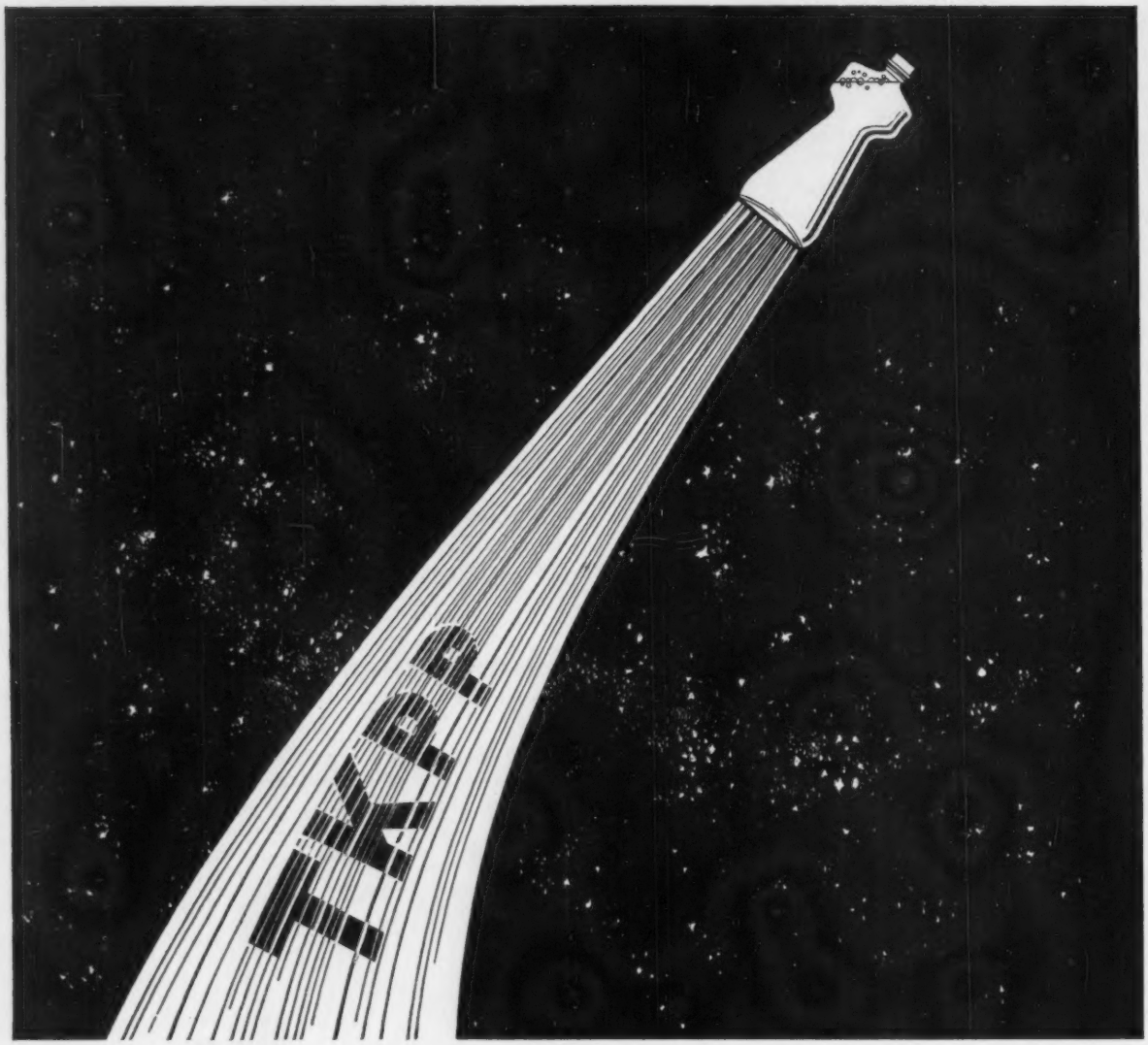
Bookkeeping Novelty: Moreover, a new trend in these financial statements is to treat them as though the pooling had taken place a year or more before the actual acquisition. This technique provides a more accurate and useful comparison of sales and earnings records from one year to the next.

Reichhold's latest annual report, for example, listed '60 sales as $99,172,873; earnings $3,351,941. Sales for '59 were given as $100,923,532; earnings, $3,831,670. The latter figures didn't jibe with the '59 annual report which listed sales of $93,615,887 and earnings of $3,623,450. But the explanation is simple. Reichhold merely adjusted the record to include '59 sales and earnings of the Alsynite Co. of America and Deecy Products Co. with which Reichhold pooled interests in '60. Reichhold's figures for '60 and '59 were compiled as if the pooling had taken place on Jan. 1, '59. Instead of showing a sharp jump in sales (really the result of the acquisitions) in '60, therefore, Reichhold's report showed a slight decline.

Again, in its first-quarter report this year, Reichhold gives sales of $23,790,000 compared with $25,176,000 for the similar period in '60, and includes financial results of the companies with which it pooled interests in '60. (Reichhold expects total '61 sales to be "well over $110 million".)

National Distillers and Chemical Corp., which plans a pooling with Bridgeport Brass, is wrestling with a similar decision. Traditionally, National has included a 10-year summary of sales and earnings in its annual report. This summary will





Puts zoom in the liquid detergent boom!

Sales of liquid detergents continue to rocket to record-breaking heights with the help of the magic booster ingredient TKPP (Tetrapotassium pyrophosphate). Household liquid detergents are taking over a fast-growing share of the cleanser market and heavy-duty liquid cleansers are moving in—thanks to TKPP.

V-C TKPP has the detergency-boosting properties of the tetrasodium pyrophosphates *plus* far greater solubility. Its solubility in water ranges from 65% to 70% by weight, depending on temperature, and it retains high solubility in the presence of wetting agents and other cleanser ingredients. TKPP is equal or superior to other condensed phosphates in buffering, water softening, dispersing and peptizing... and TKPP has excellent stability. Properly formulated detergents made with TKPP show no appreciable orthophosphate reversion after many months of storage at normal temperatures.

V-C TKPP is a clear, odorless, water-white, viscous liquid of the highest quality and purity. In addition to its role in household general purpose cleansers, laundry and dish-washing detergents, liquid soaps and shampoos, TKPP is also used in synthetic rubber manufacture and in water-based paints. *A free booklet on TKPP and samples are available on request. Write today!*

Virginia-Carolina Chemical Corporation • Chemicals Division
401 East Main Street, Richmond 8, Virginia • Phone: Milton 8-0113

V-C® TKPP

include Bridgeport figures for all 10 years, if the resume is to be continued in future reports. Or National may decide to go back only a year, as Reichhold did, and possibly eliminate its 10-year table.

Appearances can deceive: At first glance, a number of acquisitions appear to represent pooling of interests. But closer scrutiny discloses that they do not. The recent transfer to United Nuclear Corp. (a newly formed company) of the assets and business of Nuclear Development Corp. of America (White Plains, N.Y.) looks like a pooling on several counts: (1) common stock will be exchanged on a share-for-share basis. (2) NDA will be a division of United Nuclear. (Other United Nuclear divisions derive from the former Nuclear Fuels Operation of Olin Mathieson Chemical Corp. and the former Nuclear Division of Mallinckrodt Chemical Works.)

However, this combination is not technically a pooling of interests. Nor is it a merger. An NDA spokesman describes the new venture as a "joining," a method of combination chosen "for various tax and legal reasons."

Similarly, Thiokol Chemical Corp. recently moved to acquire 85-95% of the outstanding voting stock of Shawnee Industries, Inc. (Shawnee, Okla.) in exchange for 2,850 shares of Thiokol capital stock. Shawnee president, Paul Willis, will continue to act as general manager of Shawnee after the acquisition is consummated. But Thiokol, which hopes to stimulate Shawnee's "very modest scale" operations, doesn't consider its acquisition as a pooling of interests.

Popular Device: Nevertheless, most acquisitions that result from an exchange of stock can be regarded as poolings.

Pooling has changed from its original concept—a method combining companies of comparable size—to a widely used device among companies of dissimilar size but similar objectives. A wide variety of poolings now have the approval of the SEC and the NYSE. A pooling must also meet the requirements of accountants who certify the acquiring firm's annual report.

A decade ago, the pooling concept was relatively unknown among company officers. Now, it's not only widely understood but also increasingly applied.

CONOCO

Dodecylbenzyl chloride technical grade ... the intermediate for cationic surface active agents

***TYPICAL PHYSICAL PROPERTIES**

Specific Gravity at 60°F	0.965
Apparent Molecular Weight	292
Activity	Approx. 95%
Minimum Activity	90%
Flash Point (C.O.C.)	355°F.
Viscosity S.U.S. at 100°F	105
Pour Point	Less than −5°C.

CONOCO

CONOCO DBCL reacts with tertiary amines to form cationic surface-active agents—known chemically as "quaternary ammonium salts." Quaternaries are used as the active ingredients in sanitizer preparations, as textile softeners, and as antistatic agents for fibers, plastics, and paper. Nonionic surface-active agents may also be made by reacting CONOCO DBCL with the appropriate polyglycol.

For samples and further information, just send a request on your letterhead.

CONTINENTAL OIL COMPANY, PETROCHEMICAL DEPARTMENT
1270 AVENUE OF THE AMERICAS, NEW YORK 20, NEW YORK

NLRB Turnabout

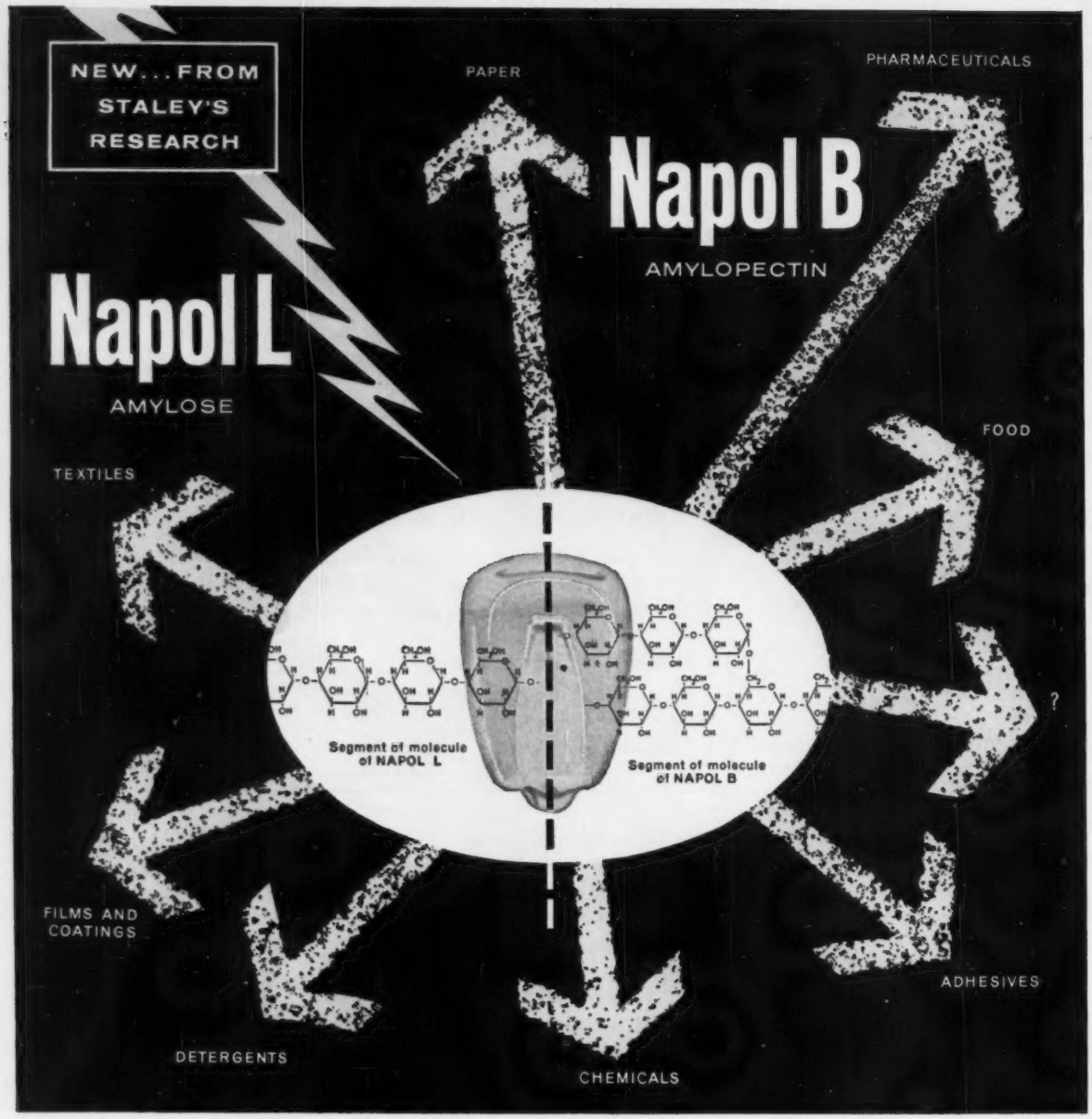
A policy switch by the new National Labor Relations Board boosts the likelihood of separate unions of maintenance workers in chemical plants. The board now says maintenance workers have a right to their own union representation—apart from chemical plant production workers—if they prefer it this way.

Under NLRB chairman, Frank McCulloch, and member Gerald A. Brown—both Kennedy appointees—the board reversed a ruling of the old Eisenhower board in a case involving four unions and the American Cyanamid Co.'s plant in Milton, Fla. The old board held that maintenance workers could not establish a separate unit at the plant; that their choice was to join the production workers in a single unit—or to reject the union altogether.

The board's four-to-one decision, in which members Boyd Leedom and John H. Fanning joined McCulloch and Brown, held that at the Cyanamid plant, the production and maintenance facilities were separate operations. Technological advances and automation at the chemical plant require employees with particular maintenance skills, apart from the production program, the board said, and these skilled employees should have the right to choose their own union.

The board's decision was at least a temporary victory for the Pensacola Building and Construction Trades Council, seeking to represent the maintenance force. The board directed a representation election, to be held within 30 days, to determine (1) whether the maintenance workers want to be represented by the council (2) whether they want to join a production unit represented by the contesting production unions — United Mine Workers District 50, International Chemical Workers, or Textile Workers Union, (3) whether the production workers want a single production union or (4) prefer no union.

This is a test case in the lively contest between craft and industrial unions—occurring in many industries—over the right to industrial plant maintenance work. Joining in the board hearings were the AFL-CIO's Industrial Union Dept., which argued for a single production unit and the Federation's Building Trades and



Major Breakthrough in Technology

Opens New Avenues of Creative Thinking for Research Chemists

A unique new process, developed by Staley's, makes possible for the first time—the separation of amylose and amylopectin fractions *from corn.*

These two natural polymers, called NAPOL L (linear) and NAPOL B (branched), indicate an almost unlimited range of applications.

NAPOL L—a linear stereospecific polymer of anhydroglucose units. Forms high strength gels. Oriented films are strong, edible, transparent, abrasion resistant. Three sites on each glucose unit available to form esters, ethers, acetals, amines. Substantive to cellulose. High reactivity with cross-linking agents.

NAPOL B—a branched, amorphous polymer of anhydroglucose units. High molecular weight. Cold water soluble. High reactivity with cross-linking agents. Solutions have stable viscosity.

For samples and technical data write to:

MARKET DEVELOPMENT DIVISION

A. E. STALEY MFG. CO.
Decatur, Illinois

Metal Trades Dept., which asked for the separate unit of skilled workers.

While the NLRB decision favors the skilled trades in the Cyanamid case, the plan is to decide each industrial-craft contest that comes along. The determinant, the agency says, will be whether the maintenance unit is or is not an integral part of production.

LABOR

Hercules Pact: A 3% wage increase for about 850 hourly employees of the Hercules Powder Co. plant at Hopewell, Va., has been agreed upon by the company and Local 13061, District 50, United Mine Workers of America. The new wages range from $1.92 to $3.25/hour. Negotiations took place under the wage re-opener clause in a two-year contract which expires May 12, '62.

•

NLRB Decisions: Unfair labor practice charges filed by the United Rubber Workers (URW) against Perry Rubber Co. (Massillon, O.), have been upheld by a National Labor Relations Board (NLRB) trial examiner. The examiner, John P. von Rohr, found that by refusing since last Aug. 15 to bargain with URW, the company has engaged in unfair labor practices as spelled out in the Taft-Hartley Act. His report calls on Perry Rubber to bargain collectively with URW Local 601 for "wages, rates of pay, hours of employment and other conditions." Von Rohr describes Local 601 as "the exclusive representative of the employees," in effect ruling out a rival union—the Perry Rubber Assn.—which was organized during a strike that lasted from August to November '60. Perry Rubber Assn. claimed it represented a majority of the company's workers and was angling for an election to allow the employees to decide which union represents them. URW officials interpret von Rohr's ruling as eliminating the need for an election.

• NLRB has issued an unfair-labor-practices complaint against the General Tire & Rubber Co. in the operation of its plant at Mayfield, Ky. URW charged that plant officials interfered with and coerced plant employees in an effort to discourage them from joining the union. NLRB says a hearing on the complaint will be held June 27 at Mayfield.

Chemical Week
ADVERTISERS' INDEX

AEROPAK, INC. 94

AIR PRODUCTS, INC. Agency—De Garmo, Inc. 54

AIR REDUCTION CHEMICAL & CARBIDE CO., DIV. OF AIR REDUCTION CO., INC. Agency—G. M. Basford Co. 45-50

ALLIED CHEMICAL CORP., GENERAL CHEMICAL DIV. Agency—Kastor, Hilton, Chesley, Clifford, & Atherton, Inc. ..... 4th cover

AMERICAN CYANAMID CO. Agency—Erwin Wasey, Ruthrauff & Ryan, Inc. 87

AMERICAN MINERAL SPIRITS CO. Agency—Leo Burnett Co., Inc. 11

AMERICAN POTASH & CHEMICAL CORP. Agency—The McCarty Co. .. 88

ANSUL CHEMICAL CO. Agency—Brad Sebstad, Inc. 86

ARCHER DANIELS MIDLAND CO. Agency—Herbert Willis & Assoc. 22

BENZOL PRODUCTS CO. Agency—The House of Twiss, Inc. 101

BERKSHIRE CHEMICALS, INC. Agency—Givauden Advertising, Inc. 107

BIRD MACHINE CO. Agency—Culver Advertising, Inc. & Walter B. Snow & Staff 20

THE CEILCOTE CO., INC. Agency—Penn & Hamaker, Inc. 70

CELANESE CHEMICAL CO. Agency—Ellington & Co., Inc. 14

CHEMICAL & INDUSTRIAL CORP., THE Agency—Strauchen & McKim Advertising 98

CHEMICAL MFG. CO. Agency—Geyer, Morey, Madden & Ballard, Inc. .. 84

CHEMICAL WEEK BUYERS' GUIDE 67

CONTINENTAL OIL CO. Agency—Clinton E. Frank, Inc. 110

COSDEN PETROLEUM CORP. Agency—Womack-Snelson Advertising 56

DAY CO., THE J. H. Agency—The Keelor & Stites Co. 7

DUPONT DE NEMOURS CO., E. I. Agency—N. W. Ayer Son, Inc. 95

EASTMAN CHEMICAL PRODUCTS, INC. Agency—Fred Wittner Co. 80-81

EMERY INDUSTRIES, INC. Agency—Farson, Huff & Northlich, Inc. 86

ESSO STANDARD DIV., OF HUMBLE OIL & REFINING CO. Agency—McCann-Erickson, Inc. 83

FMC MINERAL PRODUCTS DIV., FOOD MACHINERY & CHEMICAL CORP. Agency—James J. McMahon Adv. 85

FOXBORO COMPANY, THE Agency—Noyes & Company, Inc. 4

GENERAL AMERICAN TRANSPORTATION CORP. Agency—Edward H. Weiss & Co. 93

GERING PLASTICS DIV., STUDEBAKER-PACKARD CORP. Agency—Riedl & Freede, Inc. 52

GOULDS PUMPS, INC. Agency—The Rumrill Co., Inc. 33

GROSS & CO., INC. A. Agency—G. M. Basford Co. 42

GULF OIL CORP. Agency—Ketchum, MacLeod & Grove, Inc. ..... 3rd cover

HARSHAW CHEMICAL CO. 1

HERCULES POWDER CO. Agency—Fuller & Smith & Ross, Inc. 57

HOOKER CHEMICAL CORP. Agency—The Rumrill Co., Inc. 104

HOUSTON CHEMICAL CORP. Agency—Fuller & Smith & Ross, Inc. 21

INTERCHEMICAL CORP. Agency—Fuller & Smith & Ross, Inc. 6

INTERNATIONAL FLAVORS FRAGRANCES, INC. Agency—Oliver Beckman, Inc. 19

JEFFERSON CHEMICAL CO. Agency—Robinson-Gerard, McGary, Inc. 39

KAY-FRIES CHEMICALS, INC. Agency—Leonard Stein Adv. 90

LITHIUM CORP. OF AMERICA Agency—Hazard Advertising Co., Inc. 78

MARATHON, A DIVISION OF AMERICAN CAN CO. CHEMICAL SALES DEPT. Agency—Maercklein Advertising 66

MATHESON CO. Agency—Leonard M. Sive & Associates 69

MILES CHEMICAL CO. Agency—Klau-Van Pietersom-Dunlap, Inc. 55

MINERALS & CHEMICALS PHILIPP CORP. Agency—Wilk Advertising, Inc. 102-103

MISSISSIPPI LIME CO. Agency—Ridgeway Hirsch Adv., Co. 68

NATIONAL CARBON CO., DIV. OF UNION CARBIDE CORP. Agency—J. M. Mathes, Inc. 15

NOPCO CHEMICAL CO. Agency—Gray & Rogers Adv. 36

NORTHERN NATURAL GAS CO. Agency—Bozell & Jacobs, Inc. 10

PEARSALL CHEMICAL CORP. Agency—Wilk Advertising, Inc. 82

PETRO-TEX CHEMICAL CORP. Agency—James J. McMahon, Inc. 62

PFIZER & CO., CHAS. Agency—MacManus, John & Adams, Inc. 53, 107, 109, 111, 113

PITTSBURGH CHEMICAL CO. Agency—Erwin Wasey, Ruthrauff & Ryan Inc., Walker Div. 71-74

PLAS-TECH EQUIPMENT CORP. Agency—Creamer, Trowbridge & Case, Inc. 77

PLAX CORP. Agency—Lambert & Feasley, Inc. ..... 2nd cover

PRIOR CHEMICAL CORP. Agency—Robertson Martin Adv. 109

PUBLICKER INDUSTRIES, INC. Agency—Al Paul Lefton Co., Inc. 34-35

REILLY TAR & CHEMICAL CORP. Agency—The House of Twiss 2

RHODIA, INC. Agency—Sudler & Hennessey, Inc. 97

ROHM & HAAS CO. Agency—Arndt, Preston, Chapin, Lamb & Keen, Inc... 41

SHAWINIGAN RESINS CORP. Agency—Wilson, Haight & Welch, Inc. 31

SHELL CHEMICAL CO. Agency—Ogilvy, Benson & Mather, Inc. 89

SHELL OIL CO. Agency—Ogilvy, Benson & Mather, Inc. 8

SPROUT, WALDRON & CO., INC. Agency—Charles E. Williams Adv. 9

STALEY MFG. CO., A. E. Agency—Erwin Wasey-Ruthrauff & Ryan, Inc. .. 112

STAUFFER CHEMICAL CO. Agency—Adams & Keyes, Inc. 59-61

STEPAN CHEMICAL CO. Agency—Frank C. Nahser, Inc. 16

TEXAS BUTADIENE & CHEMICAL CORP. Agency—Muller, Jordan & Herrick Inc. 106

TEXAS NATIONAL BANK Agency—Goodwin, Dannenbaum, Littman & Wingfield, Inc. 58

UNION CARBIDE CHEMICAL CO., DIV. OF UNION CARBIDE CORP. Agency—J. M. Mathes, Inc. 65

U. S. RUBBER CO., NAUGATUCK CHEMICAL DIV. Agency—Fletcher Richards, Calkins & Holden, Inc. 13

VIRGINIA-CAROLINA CHEMICAL CORP. Agency—Albert Sidney Noble Adv. 108

WELLINGTON SEARS CO. Agency—Ellington & Co., Inc. 12

ADVERTISING STAFF

Atlanta 9 ..... Michael Miller
1375 Peachtree St., N.E. TRinity 5-0523

Boston 16 ..... Paul F. McPherson
Copley Square, COngress 2-1160

Chicago 11 ..... Alfred D. Becker, Jr., R. J. Claussen, 645 N. Michigan Ave., MOhawk 4-5800

Cleveland 13 .... H. J. Sweger, Duncan C. Stephens
1164 Illuminating Bldg., 55 Public Square, SUperior 1-7000

Dallas 1 ..... John Grant
901 Vaughan Bldg., 1712 Commerce St., Riverside 7-9721

Denver 2 ..... J. Patten,
1740 Broadway, ALpine 5-2981.

Detroit 26 ..... H. J. Sweger, Jr.,
856 Penobscot Bldg., WOodward 2-1793

Frankfurt/Main ..... Stanley Kimes,
Westendstrasse 85, Germany

Geneva ..... Michael R. Zeynel
2 Place du Port, Geneva, Switz.

Houston 25 ..... Don Hanson
W-724 Prudential Bldg., JAckson 6-1281

London W1 ..... E. E. Schirmer, ... Murphy,
McGraw-Hill House, 34 Dover St., England.

Los Angeles 17 ..... Robert Yocom,
1125 West Sixth St., HUntley 2-5450

New York 36 ..... Charles Haines, B. A. Johnson, Paul F. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXford 5-5959

Philadelphia 3 ..... William B. Hannum, Jr., J.E.B. Ladoucer, 6 Penn Center Plaza, LOcust 8-4330

Pittsburgh 22 ..... Duncan C. Stephens
4 Gateway Center, EXpress 1-1314

Portland 4 ..... Scott B. Hubbard
Room 445, Pacific Bldg., CApitol 3-5118

St. Louis 8 ..... R. J. Claussen
3615 Olive St., Continental Bldg., JEfferson 5-4867

San Francisco 4 ..... William C. Woolston
255 California St., Douglas 2-4600

ADMINISTRATION

KEY CHANGES

John L. Sanders to president and chairman of the board; **Edward E. Harding** to vice-president and treasurer; **John J. Dobler** to secretary, J. & J. Chemical Co. (Houston).

C. H. Gower to president; **E. R. Sutherland, Jr.**, to treasurer, chemical distributor William E. Phillips Inc. (Chicago).

Robert R. Cramer and **Edwin A. Sweet, Jr.**, to vice-presidents, DiNoc Chemical Arts (Rochester, N.Y.).

Stephen Sandrik is vice-president and treasurer, Simoniz Co. (Chicago).

Charles W. Coker, Jr., to the board of directors and vice-president; **P. C. Coggeshall** and **R. B. White** to vice-presidents, Sunoco Products Co. (Hartsville, S.C.).

C. W. Nofsinger to vice-chairman of the board of directors; **W. J. Price** and **George Petrie** to corporate vice-presidents, the Western Petrochemical Corp. (Kansas City, Mo.).

Julian M. Avery, E. Kent Damon, and **Charles H. Mott,** to the board of directors, Allerton Chemical Co., Inc. (Rochester, N.Y.).

George F. Ferris to the board of directors, Celanese Corp. of America (New York).

Alex J. Romanski to vice-president of operations, Michigan Chemical Corp. (Saint Louis, Mich.).

John S. Cromie to general manager, Catalytic Construction Co. (Philadelphia).

Walter C. Berger to the board of directors, Commerical Solvents Corp. (New York).

Floyd R. Shields to vice-president, Armour Pharmaceutical Co. (Chicago).

John H. Gregory to president of Canadian Blower & Forge Co., Ltd., and to president of Canada Pumps, Ltd., (both of Kitchener, Ont.).

Noel M. Fillastre to controller, Esso Standard Division (New Work), Humble Oil & Refining Co.

Leonard Sonnenberg to vice-president, Preco Chemical Corp. (Westbury, N.Y.), manufacturers of cold glaze cement finishes and protective coatings.

Tracers TO THE CHEMICAL PROCESS INDUSTRIES

Published: each Saturday—closes 11 days in advance.

Rate—$3.00 per line ($1.50 per line for position wanted ads), minimum 3 lines. Allow 5 average words as line; Count one half line for box number.

ADDRESS BOX NO. REPLIES TO:
BOX NO.——
Classified Adv. Div. of this Publication
Send to Office nearest you.
P.O. BOX 12, New York 36, N. Y.
645 N. Michigan Ave. Chicago 11, Ill.
255 California St., San Francisco 11, Calif.

POSITIONS VACANT

Development Engineer: Preferably with operating experience, capable initiating, developing, supervising metallurgical, chemical and mechanical processes, has opportunity advancement in medium size non-ferrous smelting organization, attractive Southwest city with many facilities. Age 35-50 and considerable range educational and professional background acceptable. Relocation expenses and agency fees reimbursed. Salary depends on experience and capability. P-6846, Chemical Week.

Wanted:—Chemical Engineer with graduate degree experienced in process design and industrial waste treatment. Must have 5-10 years practical experience, and be available within next six months. Address reply to P-6826, Chemical Week.

POSITIONS WANTED

Chemical Engineer—Eleven years experience re-search, development, operations, construction, organic chemicals and propulsion. Desires responsible position in R&D in small chemical firm or consulting engineering. Location Ohio, Michgan, Indiana. PW-6847, Chemical Week.

Purchasing chemicals; 5 yrs. experience; age 31; administrative-sales aptitude; B.S. degree; seeks growth. PW-6822, Chemical Week.

Chemical Sales Manager with thorough knowl-edge of the chemical industry seeks chemical company interested in substantial growth, or independent oil company considering entering the chemical market. Can provide hard hitting, technically trained marketing team. PW-6849, Chemical Week.

PROFESSIONAL SERVICES

Technical Guidance by Martin H. Gurley, Jr., Research Advisory Service, RFD. 4 Lexington, Va. COngress 1-3294.

Clark Microanalytical Laboratory—CH. N. S. Halogen, Flourine, Oxygen, Alkoxyl, Alkimide, Acetyl, Terminal Methyl, etc. by specialist in organic microchemical analysis. P.O. Box 17, Urbana, Ill., Empire 7-8406.

The Consulting Engineer. "By reason of special training, wide experience and tested ability, counled with professional integrity the consulting engineer brings to his client detached engineering and economic advice that rises above local limitations and encompasses the availability of all modern developments in the fields where he practices as an expert. His services, which do not replace but supplement and broaden those of regularly employed personnel, are justified on the ground that he saves his client more than he costs him."

CONTRACT WORK WANTED

Custom Grinding-Ultra Fine or Coarse-Specialty or Volume Blending and Grinding service on unit or contract basis. Complete CO_2 installation for Nylon, Teflon and Heat Sensitive Materials. A Cramer Corp., 10881 S. Central Avenue. Box 682 Oak Lawn, Illinois.

SPECIAL SERVICE

Hard-To-Find Chemicals located by specialists. No listing charge. Chemsearch, 2090 Peralta Way, Hanford, Calif.

BUSINESS OPPORTUNITIES

Chicago Bulk Chemical or Petroleum storage. River front location-railroad spurs. Access to tollways-will build to suit. Send for booklet-Hannah Terminals, Box 89, Lemont, Illinois-BI 2-3210.

Chemical Companies! Is your growth limited by the shortage of managerial talent or financing? If so, consider the advantages of combining management and effort with a publicly-held corporation (rated D & B AAA-1) with nationwide operations. Rapidly-growing chemical corporation desires to acquire, by purchase or merger, soundly-managed companies with annual sales volumes of $200,000.00 or more. Opportunity for present management to insure personal future by association with soundly-financed leader in the field. Address inquiries in strictest confidence to BO-6833, Chemical Week.

BOOKS

For recovery of precious metals catalysts, solu-tions send for recovery schedule. Precious Metals Recovery Corp., 85 River Road, Nutley 10, New Jersey.

PLANTS & PROPERTIES

For lease Newark, N. J. 7,000 sq. ft. Buildings 2 acres land, 5 car siding, large elec. & gas service, 120,000 gal. tank storage. Unrestricted zone. Arco Terminal Corp. S. Kearney, N. J. MA 4-1525.

WANTED/FOR SALE

This Tracer Section can be used whenever you are looking for or offering Equipment, Plants, Supplies, Chemicals, Opportunities, Special Services. The rates are low—just call or write Classified Advertising Division. Chemical Week, P.O. Box 12, N. Y. 36, N. Y., LOngacre 4-3000.

EQUIPMENT FOR SALE

Multi-million dollar chemical plant liquidation at North Little Rock, Arkansas. Stainless Steel tanks, heat exchangers, pumps, pipe, valves, etc; Pfaudler glass-lined kettles & reactors; Worthington #LTC-4 3500 cfm air compressors; Duriron exchangers & columns; Lead-lined tanks, concentrators, etc. Send for detailed circular. Perry, 1415 N. 6th St., Phila. 22, Pa.

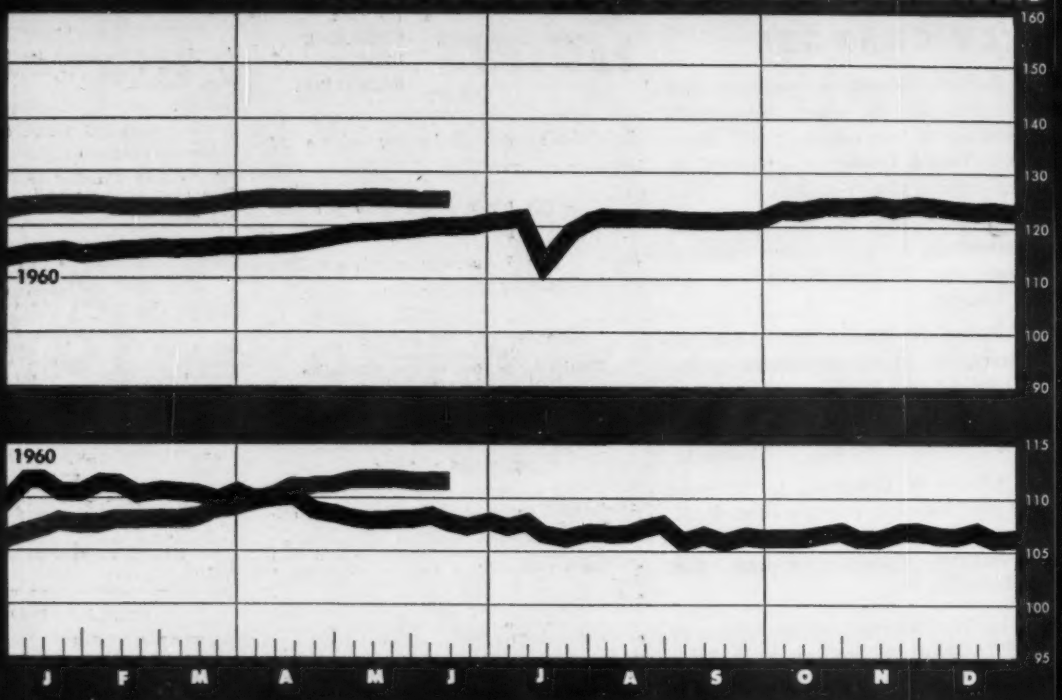
Bird 24" x 38" continuous centrifugal, T304 Stainless conical bowl. Perry, 1415 N. 6th St., Phila. 22, Pa.

1350 gal. T347 Stainless tank, 4' x 14', dished heads, ASME code 60 psi WP, 38 sq. ft. internal coils. Perry, 1415 N. 6th St., Phila. 22, Pa.

MISCELLANEOUS

To Employers Who Advertise for Men: The letters you receive in answer to your advertisements are submitted by each of the applicants with the hope of securing the position offered. When there are many applicants it frequently happens that the only letters acknowledged are those of promising candidates. (Others do not receive the slightest indication that their letters have even been received, much less given any consideration.) These men often become discouraged, will not respond to future advertisements and sometimes even question if they are bonafide. We can guarantee that Every Advertisement Printed Is Duly Authorized. Now won't you help keep our readers interested in this advertising by acknowledging every application received, even if you only return the letters of unsuccessful applicants to them marked say, "Position filled, thank you." If you don't care to reveal your identity mail them in plain envelopes. We suggest this in a spirit of helpful co-operation between employers and the men replying to Positions Vacant advertisements. Classified Advertising Division, McGraw-Hill Publishing Company, "Put Yourself in the Place of the Other Fellow."

BUSINESS BENCHMARKS



JUNE 10, 1961

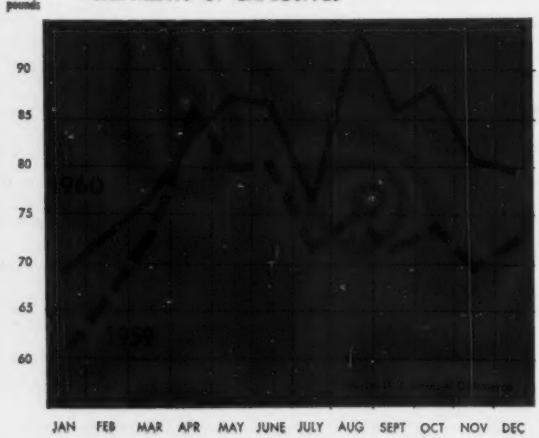
WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	125.0	125.5	121.8
Chemical Week wholesale price index (1947=100)	112.3	112.9	108.5
Stock price index (12 firms, Standard & Poor's)	53.23	52.86	50.96
Steel ingot output (thousand tons)	2,077	2,037	1,870
Electric power (million kilowatt-hours)	14,390	14,352	13,938
Crude oil and condensate (daily av., thousand bbls.)	7,054	7,061	6,814

MONTHLY INDICATORS—Wholesale Prices (1947-49=100)	Latest Month	Preceding Month	Year Ago
All commodities (other than farm & foods)	128.0	128.1	128.7
Chemicals and allied products	110.8	110.6	110.2
Industrial chemicals	123.4	123.4	124.5
Paint and paint materials	124.0	124.2	119.0
Drugs, pharmaceuticals and cosmetics	94.7	94.7	94.5
Fats and oils (inedible)	61.4	57.1	51.7
Fertilizer and materials	112.0	112.0	108.8

CHEMICAL CUSTOMERS CLOSE-UP

FACTORY SHIPMENTS OF MAJOR APPLIANCES

SHIPMENTS OF EXPLOSIVES



Would you be in the picture if petrochemicals were not?

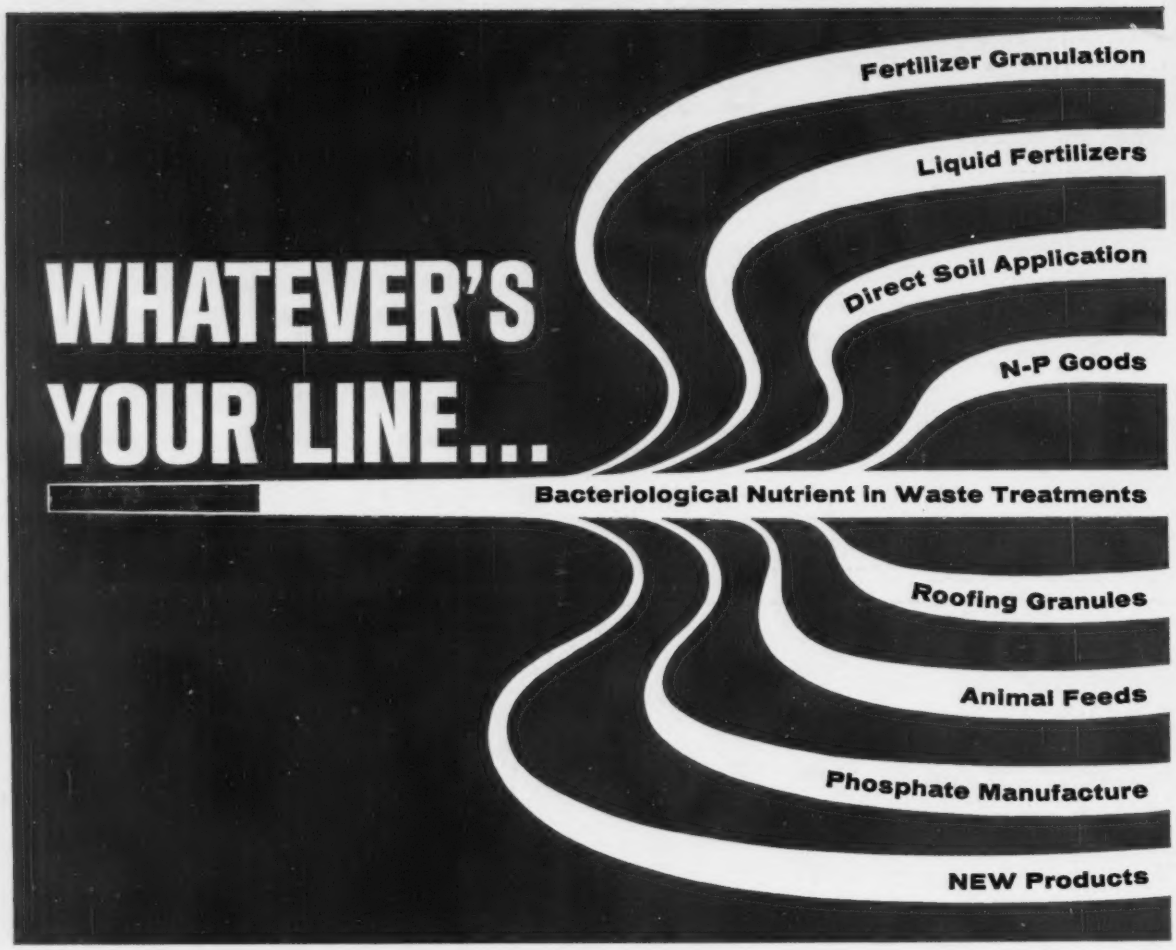
If pictures weren't bright and cameras weren't light and photographic equipment wasn't easy to manage, sure to last...would you bother? Probably not. But they are all these things. Petrochemicals help make them so. Petrochemicals coat your film with light-sensitive emulsions to put a riot of color in your color slides. They're part of the paper your pictures are printed on to make snapshots last longer. They're in the smart new vinyl shoulder bag that carries your extra lenses. *In photography,* they help persuade you and 60 million others to own, use or sell more equipment. □ Where does Gulf fit into the picture? Gulf provides the chemical industry with basic petrochemicals—the vital ingredient that increases your pleasure and the dollar returns in photography and in hundreds of other industries. Find out how Gulf Petrochemicals can serve you. Write or call our Sales Office, 360 Lexington Avenue, New York 17, New York.

QUALITY PETROCHEMICALS TO BEGIN WITH

Benzene · Cyclohexane · Propylene · Oxo Alcohols · Ethylene
Toluene · Sulfur · Propylene Trimer and Tetramer

GULF

PETROCHEMICALS DEPARTMENT, GULF OIL CORPORATION, PITTSBURGH, PENNSYLVANIA



Your ONE source for the best quality wet process

PHOSPHORIC ACID, 75%, is GENERAL CHEMICAL

The highest grade of wet process phosphoric in production, showing a consistent 75% concentration of H_3PO_4, is now being supplied from General Chemical's new E. St. Louis plant.

Green acid that is really green, this higher quality acid is freer from solids . . . cleaner, purer, and easier to use than other wet process phosphorics.

Take advantage of the savings this higher quality phosphoric can bring you!

Every user of phosphoric acid is invited to check with General Chemical for present supply or future requirements. Call or write your nearest General Chemical office for samples, information, and prices.

Allied Chemical

GENERAL CHEMICAL DIVISION

40 Rector Street, New York 6, N. Y.